

A long-term effort to determine $^{40}\text{Ar}/^{39}\text{Ar}$ ages of Alaskan mineral deposits

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Final Report

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Abstract and summary

This project is the first in a long-term effort to date and characterize gold deposits in Alaska. The first areas of focus are the Seward Peninsula and the Brooks Range belts in western and northern Alaska. This work was funded by Grant 04HQGR0163 from the USGS Mineral Resources External Research Program to the University of Alaska Fairbanks.

Gold-quartz veins in Northern Alaska are broadly classified as ‘orogenic/metamorphic’ as they occur in multiply deformed, greenschist-overprinted blueschist metamorphic rocks with the nearest magmatic bodies 10s to 100s of km away. Lack of reliable radiometric ages for these mica-poor veins makes them poorly constrained geologically and the currently popular model relates them to a ca 90-100 Ma magmatic welt and related metamorphic dewatering. Limited dating of veins from the Southern Brooks range has so far shown evidence only for a 112-115 Ma vein event. In contrast, our > 70 $^{40}\text{Ar}/^{39}\text{Ar}$ age determinations on glaucophane, barroisite, winchite, phengite, and biotite from the Nome-Council area on veins and rocks indicates several vein forming episodes, all older than the bulk of magmatism on the Seward Peninsula.

Well-constrained glaucophane ages > 205 Ma indicate peak blueschist conditions in the late Triassic; an undisturbed biotite plateau age of 184 Ma from a schist sample indicates rapid cooling (thrusting?) by mid-Jurassic. Barroisite and Winchite and Na-phengite plateau ages of 138- 144 Ma indicate fluid influx associated with upper greenschist conditions by the late Jurassic. Na-poor phengites commonly yield ‘messy’ spectra and integrated, plateau, or weighted ages of ~ 125 -128 Ma, suggesting continued fluid flux and recrystallization in the early Cretaceous. Vein mica ages suggest three main vein events. (1) Early, deformed veins yield complex spectra with ages of ~ 112 -115 Ma. (2) More common, sharp-walled, through-going veins with micas yielding excellent plateau ages of 106-109 Ma; these veins have 310/steep orientations. Very rare mafic alkalic dikes (Ti-garnet & analcime-bearing foid monzodiorite) are usually altered beyond dating; biotite from one gave an age of 107 Ma. We infer these veins are extension-related; limited oxygen isotope data suggests that convection of meteoric water along faults was a major factor. (3) A minor late vein event is suggested by 1 vein mica age of 102 Ma. Alkalic mafic dikes occur with 030 strikes; biotite from these uniformly yield 80-84 Ma ages, indicating late Cretaceous extension at a different orientation. Larger Au-vein deposits on the Seward Peninsula (e.g., the Rock Creek deposit) also yield multiple vein ages, indicating repeated mineralization events.

Methodology

For $^{40}\text{Ar}/^{39}\text{Ar}$ analysis, samples were submitted to the Geochronology laboratory at UAF. For the samples, separates of biotite, white mica or amphibole were made, or for some samples, mm-sized chips were prepared. The monitor mineral MMhb-1 (Samson and Alexander, 1987) with an age of 513.9 Ma (Lanphere and Dalrymple, 2000) was used to monitor neutron flux (and calculate the irradiation parameter, J). The samples and standards were wrapped in aluminum foil and loaded into aluminum cans of 2.5 cm diameter and 6 cm height. The samples were irradiated in position 5c of the uranium enriched research reactor of McMaster University in Hamilton, Ontario, Canada for 20 megawatt-hours.

Upon their return from the reactor, the samples and monitors were loaded into 2 mm diameter holes in a copper tray that was then loaded in a ultra-high vacuum extraction line. The monitors were fused, and samples heated, using a 6-watt argon-ion laser following the technique

described in York et al. (1981), Layer et al. (1987) and Layer (2000). Argon purification was achieved using a liquid nitrogen cold trap and a SAES Zr-Al getter at 400C. The samples were analyzed in a VG-3600 mass spectrometer at the Geophysical Institute, University of Alaska Fairbanks. The argon isotopes measured were corrected for system blank and mass discrimination, as well as calcium, potassium and chlorine interference reactions following procedures outlined in McDougall and Harrison (1999). System blanks generally were 2×10^{-16} mol ^{40}Ar and 2×10^{-18} mol ^{36}Ar which are 10 to 50 times smaller than fraction volumes. Mass discrimination was monitored by running both calibrated air shots and a zero-age glass sample. These measurements were made on a weekly to monthly basis to check for changes in mass discrimination.

The age, Ca/K and Cl/K spectra plots are displayed in Appendix 1 while detailed analyses are given in Appendix 2. A summary of all the $^{40}\text{Ar}/^{39}\text{Ar}$ results is given in Tables 1, 2 and 3, with all ages quoted to the ± 1 sigma level and calculated using the constants of Steiger and Jaeger (1977). The integrated age is the age given by the total gas measured and is equivalent to a potassium-argon (K-Ar) age. The spectrum provides a plateau age if three or more consecutive gas fractions represent at least 50% of the total gas release and are within two standard deviations of each other (Mean Square Weighted Deviation less than ~ 2.5).

Preliminary geochronology summary

Fifty seven analyses of twenty seven samples from the Seward and Brooks range districts have been analyzed as part of this project. Multiple runs were done to check for age homogeneity and to better define the range of metamorphic conditions preserved in the samples. For these samples using multiple analyses was deemed more important than encapsulating fine-grained material. An additional 10 samples (4 from Wiseman, 6 from the Seward Peninsula) have been prepared but have not yet been analyzed due to instrument problems, but will be measured in early 2006 (these problems have also delayed this report). Data from these samples will be submitted under separate cover. The results from this investigation will be presented at the 2006 GSA Cordilleran Meeting in Anchorage, Alaska.

Wiseman district (Table 1)

Samples 03SH217 and SALSAHTRB are from mineralized zones in the Wiseman district and show a narrow age range of 112 - 115 Ma. Older ages seen in samples 10650A, 10650B, and 11059 show either excess argon, or reflect pre-mineralization metamorphism.

Seward Peninsula (Tables 2 and 3)

The oldest ages are seen in a glaucophane sample (04RN030A) with an age of ~ 209 Ma, and is interpreted to represent the timing of peak blueschist metamorphism in the Triassic. Biotite from sample 04MBW332A has an age of ~ 186 Ma indicating the time of rapid cooling in the mid-Jurassic and glaucophane from 04RN128A has an age of ~ 164 Ma. Coarse mica from a thrust fault (04MBW540A) has an age of ~ 148 Ma, and amphibole (winchite) vein sample 04RN318A has an age of 139 Ma (white mica sample 04RN318B has a younger age of 127 Ma).

The majority of schist samples (04Z288A, 04Z296A, 03MBW390a) have ages that range from 116 – 135 Ma, and this variation seems to correlate with phengite composition. Samples from vein material seem to cluster into three ages: 112 – 115 Ma (04Z156, 04Z638A, EF88-42),

106 – 109 Ma (04RN319A, 04RN351B, 04RN355C, 04RN500C) and a single sample at 102 Ma (04Z641).

The last stage of activity is seen by alkaline to mafic dikes with ages of ~107 Ma (04SAH119A), 80 – 84 Ma (04MBW384C, 04MBW525A, 04MBW94A). A summary of the proposed metamorphic path for the Seward Peninsula is shown in Figure 1.

Table 1 Wiseman district data

Sample	Min.	Integrated Age (Ma)	Plateau Age (Ma)	Plateau Information	Other ages
Wiseman district					
SOLSCHTRB	WM#1	115.1 ± 0.3	115.2 ± 0.3 (P)	8 fractions 85% ³⁹ Ar release MSWD = 0.8	Tail at the end 123 Ma
	WM#2	115.1 ± 0.4	115.1 ± 0.4 (P)	9 fractions 83% ³⁹ Ar release MSWD = 1.4	
	WM#3	115.2 ± 0.4	115.6 ± 0.4 (P)	11 fractions 94% ³⁹ Ar release MSWD = 1.7	
03SH217	WM#1	112.5 ± 0.4	112.7 ± 0.4 (P)	12 fractions 96% ³⁹ Ar release MSWD = 1.6	
	WM#2	112.7 ± 0.4	113.0 ± 0.4 (P)	11 fractions 90% ³⁹ Ar release MSWD = 1.0	
	WM#3	113.3 ± 0.4	114.3 ± 0.4	8 fractions 67% ³⁹ Ar release MSWD = 1.2	
10650A	WM	130.8 ± 0.4	125.9 ± 0.7 (P)	5 fractions 50% ³⁹ Ar release MSWD = 2.7	Wiseman
10650B	WM	123.7 ± 0.4	121.7 ± 0.9 (W)	8 fractions 68% ³⁹ Ar release MSWD = 5.1	wiseman
11059	WM	122.0 ± 0.4	118.2 ± 0.5 (W)	4 fractions 40% ³⁹ Ar release MSWD = 1.8	Excess! Isoc at 106.5 ± 3.1

Bold: Preferred age for each sample (ages reported at ± 1 sigma)

Mineral: WM: White Mica; AM: Amphibole; GP: Glaucofane; BI: Biotite; Not run: Sample is still at reactor and will be run in 2006

(P) Plateau.: 3+ consecutive fractions, MSWD < ~2.5, more than 50% ³⁹Ar release.

(W) Weighted mean age of 'plateau-like' fractions.

Table 2 Seward Peninsula data

Sample	Min.	Integrated Age (Ma)	Plateau Age (Ma)	Plateau Information	Other ages
Prograde metamorphism					
04RN030A	PAR	236.0 ± 0.7	208.7 ± 1.9 (W)	4 fractions 44% ³⁹ Ar release MSWD = 7.6	
04RN030A	GP	320.5 ± 1.7	-	-	Stairstep up
Seward (Retrograde bio)					
04MBW332A	BI	184.7 ± 0.5	186.2 ± 2.0 (W)	4 fractions 33% ³⁹ Ar release MSWD = 16.0	
Glaucophane					
04RN128A	GP	149.9 ± 1.8	164.1 ± 4.4 (W)	3 fractions 51% ³⁹ Ar release MSWD = 2.8	170 is initial retrograde
Seward Met rocks Coarse wm in Thrust fault?					
04MBW540A	WM	143.4 ± 0.4	143.7 ± 4.1 (W)	10 fractions 99% ³⁹ Ar release MSWD = 107.5	Not meta rocks
Amphibole (Winchite) vein					
04RN318A	AM	142.3 ± 1.3	138.6 ± 1.0 (P)	5 fractions 75% ³⁹ Ar release MSWD = 0.6	
04RN318B	WM	127.3 ± 0.3	127.4 ± 3.4 (W)	11 fractions 100% ³⁹ Ar release MSWD = 131.0	
Schist wall rock along a vein (Wm meta ages), West Creek Prospect					
04Z288A	WM#1	132.9 ± 0.4	135.1 ± 1.4 (W)	3 fractions 56% ³⁹ Ar release MSWD = 5.2	
	WM#2	129.7 ± 0.4	130.7 ± 1.6 (W)	10 fractions 93% ³⁹ Ar release MSWD = 15.2	
	WM#3	131.8 ± 0.4	130.2 ± 0.7 (W)	5 fractions 45% ³⁹ Ar release MSWD = 2.6	
04Z296A	WM#1	128.0 ± 0.4	128.7 ± 2.9 (W)	11 fractions 94% ³⁹ Ar release MSWD = 53.3	Reset by mafic dikes?
	WM#2	125.2 ± 0.3	126.7 ± 1.2 (W)	9 fractions 76% ³⁹ Ar release MSWD = 9.3	
	WM#3	126.8 ± 0.4	128.2 ± 0.8 (W)	5 fractions 54% ³⁹ Ar release MSWD = 3.8	Minimum ages

Table 2 (continued)

Sample	Min.	Integrated Age (Ma)	Plateau Age (Ma)	Plateau Information	Other ages
Big Hurrah mine, Seward Peninsula					
EF88-42	WM#1	117.8 ± 0.6	119.1 ± 0.6	4 fractions 60% ^{39}Ar released MSWD = 0.8	Slight hump in spectrum
	WM#2	115.8 ± 0.6	117.2 ± 0.7	6 fractions 74% ^{39}Ar released MSWD = 0.9	High temp age 121.9 ± 0.9 10% ^{39}Ar rel.
	WM#3	119.3 ± 0.6	119.5 ± 2.5 (W)	5 fractions 50% ^{39}Ar released MSWD = 13.4	Slight hump in spectrum
	WM#4	120.4 ± 0.7	120.4 ± 0.7	5 fractions 60% ^{39}Ar released MSWD = 1.0	High temp age 125.1 ± 1.3 8% ^{39}Ar rel.
	WM#5	118.9 ± 0.6	119.4 ± 0.7	4 fractions 36% ^{39}Ar released MSWD = 1.0	Slight hump High temp age 121.5 ± 0.9 6% ^{39}Ar rel.
	WM#6	114.9 ± 0.7	114.8 ± 0.9	3 fractions 51% ^{39}Ar released MSWD = 0.2	High temp age 119.0 ± 0.7 32% ^{39}Ar rel.
Solomon Quad					
04Z156	WM	113.2 ± 0.3	112.8 ± 0.3 (P)	12 fractions 69% ^{39}Ar release MSWD = 0.9	
Rock creek drill core					
04Z638A	WM#1	113.2 ± 0.6	112.8 ± 1.4 (W)	5 fractions 58% ^{39}Ar release MSWD = 5.2	
	WM#2	112.0 ± 0.7	112.3 ± 0.8 (P)	5 fractions 71% ^{39}Ar release MSWD = 2.1	
04Z641	WM	101.5 ± 0.7	102.3 ± 0.7 (P)	7 fractions 96% ^{39}Ar release MSWD = 0.2	

Table 2 (continued)

Sample	Min.	Integrated Age (Ma)	Plateau Age (Ma)	Plateau Information	Other ages
Solomon Quad., Seward pen. veins ~107					
04RN319A	WM	107.8 ± 0.7	107.5 ± 0.7 (P)	11 fractions 81% ³⁹ Ar release MSWD = 1.0	
04RN351B	WM	107.3 ± 0.6	107.7 ± 0.6 (P)	9 fractions 98% ³⁹ Ar release MSWD = 0.6	
04RN355C	WM#1	106.2 ± 0.8	106.5 ± 0.8 (P)	10 fractions 99% ³⁹ Ar release MSWD = 2.3	
	WM#2	105.8 ± 0.7	106.0 ± 0.7 (P)	8 fractions 98% ³⁹ Ar release MSWD = 2.2	
04RN500C	WM#1	106.6 ± 1.1	116.7 ± 2.1 (W)	6 fractions 67% ³⁹ Ar release MSWD = 3.0	Ar loss Model at 118 Ma
	WM#2	105.6 ± 1.0	117.7 ± 1.0 (P)	5 fractions 59% ³⁹ Ar release MSWD = 2.1	Ar loss Model at 118 Ma
Extremely alkalic dike					
04SAH119A	BI	106.9 ± 0.6	107.2 ± 0.6 (P)	11 fractions 99% ³⁹ Ar release MSWD = 1.1	
Mafic dikes (Unrelated to mineralization)					
04MBW384C	BI	84.7 ± 0.4	83.9 ± 0.3 (P)	4 fractions 71% ³⁹ Ar release MSWD = 1.8	Good isochron
04MBW525A	BI	83.2 ± 0.2	83.5 ± 0.4 (W)	4 fractions 60% ³⁹ Ar release MSWD = 3.3	Good isochron
04MBW94A	BI	80.8 ± 0.3	80.1 ± 1.3 (W)	3 fractions 60% ³⁹ Ar release MSWD = 18.3	

Bold: Preferred age for each sample (ages reported at ± 1 sigma)

Mineral: WM: White Mica; AM: Amphibole; GP: Glaucofane; BI: Biotite; Not run: Sample is still at reactor and will be run in 2006

(P) Plateau.: 3+ consecutive fractions, MSWD < ~2.5, more than 50% ³⁹Ar release.

(W) Weighted mean age of 'plateau-like' fractions.

Table 3 03MBW390a Mica Schist

Min.	Integrated Age Ma)	Plateau Age (Ma)	Plateau Information	Ca/K	Cl/K
WM#1	129.1 ± 0.8	131.6 ± 1.6 (W)	2 fractions 58% ³⁹ Ar released MSWD = 2.5	0.005	0.0007
WM#2	129.8 ± 0.7	119.4 ± 0.7 (P)	5 fractions 60% ³⁹ Ar released MSWD = 1.1	0.001	0.0007
WM#3	126.7 ± 0.8	129.0 ± 0.8 (P)	3 fractions 67% ³⁹ Ar released MSWD = 1.0	0.000	0.0009
WM#4	117.2 ± 1.0	117.1 ± 0.9 (P)	7 fractions 96% ³⁹ Ar released MSWD = 0.4	0.006	0.0010
WM#5	130.4 ± 0.8	132.6 ± 6.4 (W)	3 fractions 84% ³⁹ Ar released MSWD = 64.4	0.004	0.0005
WM#6	116.3 ± 0.7	116.7 ± 0.7 (P)	10 fractions 99% ³⁹ Ar released MSWD = 1.8	0.007	0.0009
WM#7	136.1 ± 1.0	127.4 ± 3.4 (W)	7 fractions 37% ³⁹ Ar released MSWD = 5.1	0.029	0.0008
WM#8	120.6 ± 0.7	123.0 ± 0.8 (P)	3 fractions 66% ³⁹ Ar released MSWD = 1.3	0.005	0.0009
WM#9	123.2 ± 0.7	123.7 ± 2.0 (W)	9 fractions 98% ³⁹ Ar released MSWD = 8.4	0.003	0.0009
WM#10	118.1 ± 0.9	117.9 ± 2.8 (W)	9 fractions 90% ³⁹ Ar released MSWD = 10.0	0.261	0.0014
WM#11	121.9 ± 0.7	123.9 ± 0.7 (P)	3 fractions 61% ³⁹ Ar released MSWD = 1.7	0.010	0.0007
WM#12	131.1 ± 0.7	130.4 ± 1.7 (W)	8 fractions 54% ³⁹ Ar released MSWD = 4.7	0.005	0.0007
WM#13	130.9 ± 0.8	132.9 ± 2.8 (W)	4 fractions 72% ³⁹ Ar released MSWD = 11.9	0.010	0.0013
WM#14	119.1 ± 5.8	123.5 ± 5.3 (P)	5 fractions 71% ³⁹ Ar released MSWD = 0.6	1.68	0.0058
WM#15	122.3 ± 0.7	120.4 ± 1.9 (W)	7 fractions 50% ³⁹ Ar released MSWD = 7.7	0.025	0.0005

Bold: Preferred age for each sample (ages reported at ± 1 sigma)

Mineral compositions and apparent ages of the Seward Peninsula minerals

Complex age spectra determined for this study in part reflect the complex series of crystallization and re-crystallization events and in part reflect the presence of multiple phases (in some cases different compositions of a single mineral) in a given sample. Both amphiboles and ‘white micas’ from the region exhibit significant compositional variations, in many cases within a single sample. In addition, recent geologic mapping demonstrates an abundance of both thrust faults and high-angle faults; measured ages vary depending on structural block sampled.

$^{40}\text{Ar}/^{39}\text{Ar}$ dating experiments were performed on four different amphibole samples, each representing different compositions (Fig. 2) and yielding different age spectra. In these rocks, amphiboles are of 3 sorts: sodic—with most of the alkali site occupied by Na^+ ; calcic-sodic—with sub-equal or slightly greater Ca^{2+} than Na^+ ; and calcic—with the alkali site occupied primarily by Ca^{2+} . In addition, amphiboles are classified (and commonly contain different amounts of K^+ and retain Ar differently) depending on the balance between Si and Al in tetrahedral coordination. Glaucophane (sensu stricto) is stable at high pressure and moderate temperature; hornblende at low pressure and high temperature; actinolite at low pressure and low temperature; and the intermediate (calcic-sodic) amphiboles at intermediate pressures. Glaucophane is stable under the earlier blueschist facies conditions; with addition of water at decreasing pressure calcic-sodic and then calcic amphiboles are formed. Those samples with amphiboles displaying little compositional variability gave simpler and more easily-interpreted spectra.

The spectra for sample RN128A (a glaucophane with limited variation, Fig.2) is relatively simple. This sample was relatively ‘clean’, with minor fine-grained white mica and chlorite, and the spectrum displays consistently and old ages for those fractions with a Ca/K of ~ 30. This ratio matches those microprobe analyses for relative pure glaucophane. We interpret these data as indicating cooling below the blocking temperature for glaucophane (~ 450°C?) at ~ 165 Ma. The younger ages for lower Ca/K fractions represent a small amount of fine-grained white mica present in the sample. Because the mica has such an enormously higher K content than the glaucophane (~ 10% vs. ~ 500 ppm), tiny amounts of admixed mica make a serious contribution to the spectrum. Fortunately, the lower Ar retention temperature for fine-grained white mica make it easy to distinguish its contribution to the overall age spectrum. Unfortunately, this sample, while very clean, was taken from an area with ambiguous relations between the host unit and the underlying rocks: it might or might not be part of a thrust sheet.

In contrast, glaucophane from sample RN30A displays considerable compositional variation (Ca/K ratio) in both the incremental release spectra and the microprobe analyses. In addition, the spectrum was complicated by the presence of significant contamination with epidote. The lower potassium content of this glaucophane relative to RN128A (~ 0.02% K₂O vs. ~0.05% K₂O, respectively) is reflected in the higher Ca/K ratio and the lack of age resolution for RN30A. Glaucophane in the sample is also partly altered to actinolite, with a lower Ca/K ratio. We interpret the anomalously old ages for most of the steps as due to excess Ar trapped in the low-K phases epidote and low-K glaucophane, and the youngest step (187± 3 Ma) to reflect the time of the retrograde alteration.

However, sample RN30A also yielded sufficient paragonite (Na-rich white mica) for dating. Due to the small size of Na^+ relative to K^+ , the unit cell of paragonite is significantly smaller than that of muscovite. The blocking temperature for paragonite is thus higher than that of muscovite, and may be as high as 400°C. Contamination by a small amount of glaucophane

gives the anomalously old ages with high Ca/K ratios; of the middle portion of the release spectrum with Ca/K of ~ 1.5 -2 (a mixture of glaucophane and paragonite?) yielded a relatively consistent pseudoplateau of 209 Ma (late Triassic). Excess Ar in the paragonite itself is likely not a problem as the mica typically contains $\sim 1\%$ K_2O . This sample is definitely from a thrust plate; we interpret the late Triassic paragonite age as indicating the time of cooling below $\sim 400^\circ C$ in response to thrusting.

Sample MBW 393 also shows considerable compositional variability (Fig. 2) and release spectra with large variations in Ca/K and apparent age. This amphibole is a sodic-calcic one, reflecting intermediate pressure conditions, and was taken from a rock that contained no obvious glaucophane relicts. In an attempt to better constrain the age of this intermediate-pressure retrograde hydration, numerous splits of the sample were analyzed. The data, presented as apparent age vs. Ca/K ratio for the more reliably determined (low relative error) fractions, displays a clear increase in apparent age with Ca/K ratio in the amphibole (Fig. 3). Because these Ca/K ratios (~ 30) are typical of glaucophane, we suspect that these amphibole fractions are remnant glaucophanes, giving the older (late Triassic) apparent ages. The sub-linear relation between apparent age and Ca/K ratio, suggest a simple mixing of residual glaucophane and younger barroisite. Thus, the complex spectra for this sample are consistent with the data from the two 'glaucophane' samples, in indicating original blueschist metamorphism in the late Triassic and subsequent hydration in the Cretaceous. This sample is from the sheet under that of RN30; its younger apparent age and greater degree of retrograde alteration is presumably due to its structural position.

Sample RN318 is, like RN128, of limited compositional variability (Fig. 2) and displays a simple Ar release spectrum. The sample is from a amphibole-epidote vein that cuts foliation and clearly indicates the timing of post-ductile deformation. However, microprobe analyses indicate Ca/K ratios of 40-60, with an average of 48—too high to match the Ca/K ratios (~ 35) for the bulk of the release spectrum. We suspect that contamination by a very small amount of white mica is responsible for the observed Ca/K ratio. The plateau age of 139 Ma for this sample is a reliable determination of moderate -T conditions (winchite stable) by late Jurassic time. The younger age for the white mica from the same sample confirms the lower blocking temperature of K-rich mica relative to Na-rich mica.

White micas display similar complications both in compositions and age spectra. In the study area, two general types—Na-rich ('paragonite') and K-rich ('muscovite')—are present. In addition both, but especially K-rich mica, undergoes partial substitution of Si + Mg or Fe for 2Al, the so-called phengite solid solution (Fig. 4). Experimental work indicates that K micas with higher celadonite component (more phengitic) are stable at higher pressure (Figs. 4 and 1); different workers have published different P-T- compositional results, however. Micas with compositions closer to the theoretical muscovite or paragonite end-members ought to form and be stable at relatively low P, and thus reflect post-regional metamorphic conditions (e.g., vein formation). Complications are caused by grain size and Na/K abundance variations.

Sample RN 355C—with a well-defined plateau age of 106-107 Ma—is representative of well-behaved vein mica samples (Fig 4). The compositions of the mica show little variation and little celadonite component. The low K/Na ratio indicates a paragonite-rich solid solution with approximately the maximum amount of K for a high-Na mica. More commonly, the well-behaved vein micas have high K contents, but in all cases display small celadonite components. Sample RN500C, although also with low celadonite, contains a very high Na/K ratio, and is nearly pure paragonite (Fig. 4). This and other very paragonite-rich micas (e.g., RN318A) gave

poor spectra due to a combination of low K contents and fine grain sizes. (The high Ca/K ratios for the low-T fractions) from RN 500C are due to contaminant calcite). RN500C behaves as if it suffered from recoil effects; hence, the integrated age of ~ 107 Ma is an approximation to the age of vein formation.

Samples with higher celadonite contents yield generally messier results. Sample Z638, from the Rock Creek gold deposit, yielded a somewhat humpy spectrum with a 'plateau' MSWD of 2-5, reflecting modest apparent age variations between fractions. The composition of mica from this sample ranges from moderate- to low-celadonite (Fig. 4) indicating a combination of wall-rock micas dragged into the vein and new hydrothermal (low-P) mica. (The high Ca/K ratios for low-T fractions are again due to minor calcite contamination. The paragonite content of 20-30% is approximately the maximum for K-rich micas at moderate temperature). Hence, the less-than-ideal age spectra are caused by a mixture of new and more-or-less completely reset wallrock micas in the vein. The 'plateau' age of 112-113 Ma is significantly older than the 106-109 Ma ages determined for most veins on the Seward Peninsula; the compositional data indicate that this older age is not simply an artifact of partial resetting.

Sample EF88-42 from the Big Hurrah deposit displays similar, but not as clear-cut, results. Six different splits of mica from this vein sample yielded plateau and pseudo-plateau ages of ~115-120 Ma, with highest-T fraction ages of 119-125 Ma. Compositions of the dated micas (Fig 4) clearly show significant variations; most have high celadonite contents characteristic of metamorphic (wallrock) white mica; three analyses have lower celadonite indicating recrystallization under lower-P conditions. The age spectrum data for the six splits are thus best viewed in terms of variable degrees of reset of metamorphic micas. The youngest 'plateau' age of 115 Ma is a maximum age for vein formation; most likely the vein formed at approximately the same time as the mica from Z 638, but experienced a small fluid flux and (or) lower-temperature fluids.

Two more micas, displayed on Fig 4, illustrate compositional behavior for well-behaved and poorly behaved metamorphic white micas. Sample MBW 540A, taken from a mapped thrust fault, displays a limited compositional variability and a relatively high celadonite component. The Ar-release spectrum for the sample shows modest apparent age variability, but no obvious pattern of Ar losses or gains. The spectrum is compatible with relatively quick cooling of a white mica with some compositional (and Ar-retention) variability. The plateau age of ~ 144 Ma for the sample, in agreement with the ~ 139 Ma age for vein winchite from sample RN318B, indicates that the main phase of ductile deformation was over by the latest Jurassic.

In contrast, white mica from sample MBW390A shows considerable compositional variation and generally lower celadonite component than that of 540A (Fig 4). Fourteen attempts were made to determine an age on this sample, yielding plateau and pseudo-plateau ages of ~117 to ~133 Ma. These samples really consisted of essentially one mineral—white mica—but the compositional variability (as indicated by celadonite component, Fig 4) shows that the micas were partly recrystallized and lost some argon. The data are compatible with a last metamorphism at approximately 140 Ma combined with younger Ar losses. An obvious possibility is that they experienced some of the fluid and heat flux associated with the 'older' vein episode of ~112-114 Ma.

References

Lanphere, M.A., and Dalrymple, G.B., 2000, First-principles calibration of ^{38}Ar tracers: Implications for the ages of $^{40}\text{Ar}/^{39}\text{Ar}$ fluence monitors, U.S. Geological Survey Professional Paper 1621, 10 p.

Layer, P.W., Hall, C.M. & York, D., 1987. The derivation of $^{40}\text{Ar}/^{39}\text{Ar}$ age spectra of single grains of hornblende and biotite by laser step heating, *Geophys. Res. Lett.*, **14**, 757-760.

McDougall, I. and Harrison, T.M., 1999, *Geochronology and Thermochronology by the $^{40}\text{Ar}/^{39}\text{Ar}$ method-2nd ed*, Oxford University Press, New York, 269pp.

Steiger, R.H. and Jaeger, E., 1977, Subcommittee on geochronology: Convention on the use of decay constants in geo and cosmochemistry, *Earth and Planet Science Letters*, v. 36, p. 359-362.

York, D., Hall, C.M., Yanase, Y., Hanes, J.A. & Kenyon, W.J., 1981. $^{40}\text{Ar}/^{39}\text{Ar}$ dating of terrestrial minerals with a continuous laser, *Geophys. Res. Lett.*, **8**, 1136-1138.

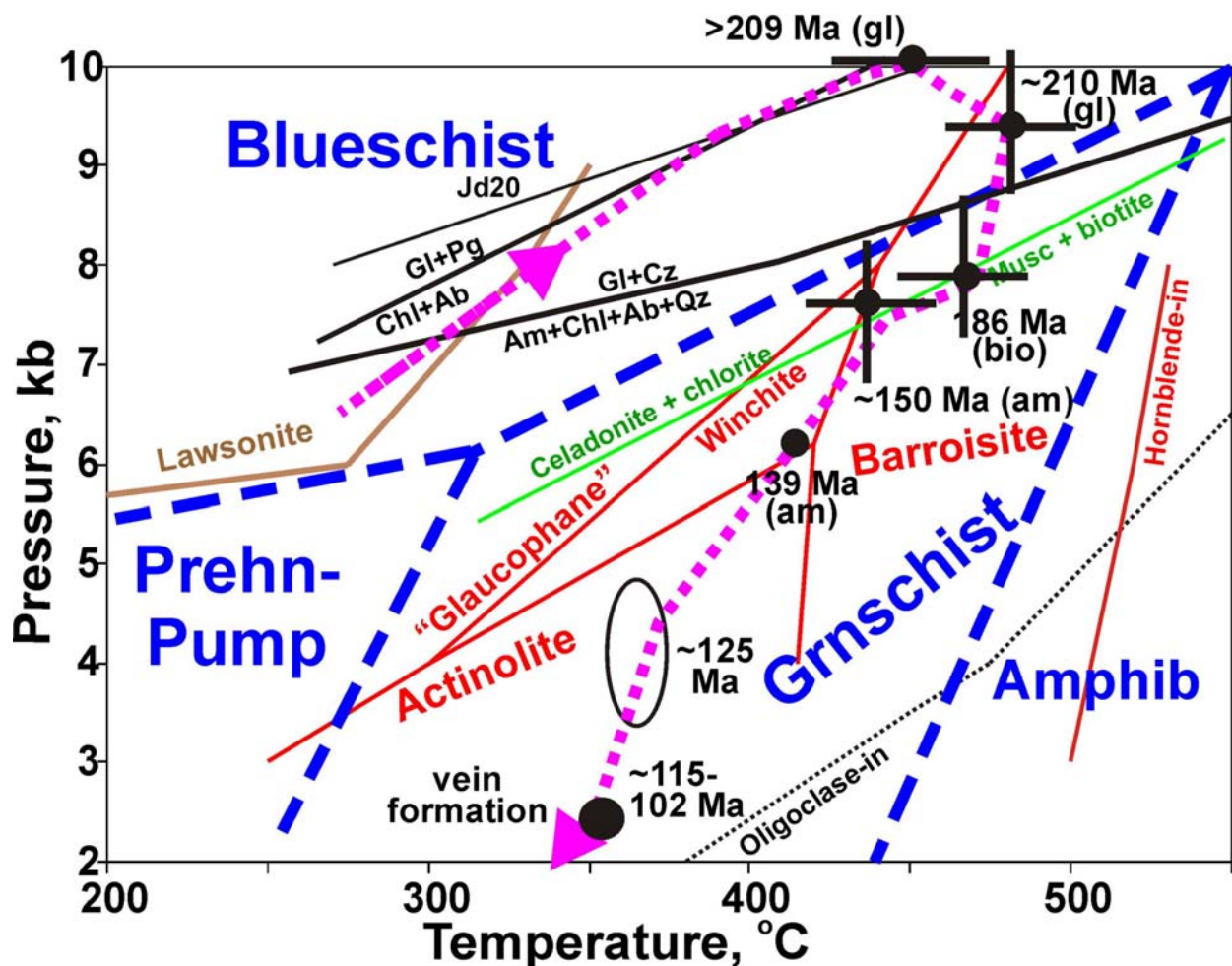


Figure 1. Mineral stability fields and proposed P-T-t path for the Seward peninsula metamorphic rocks.

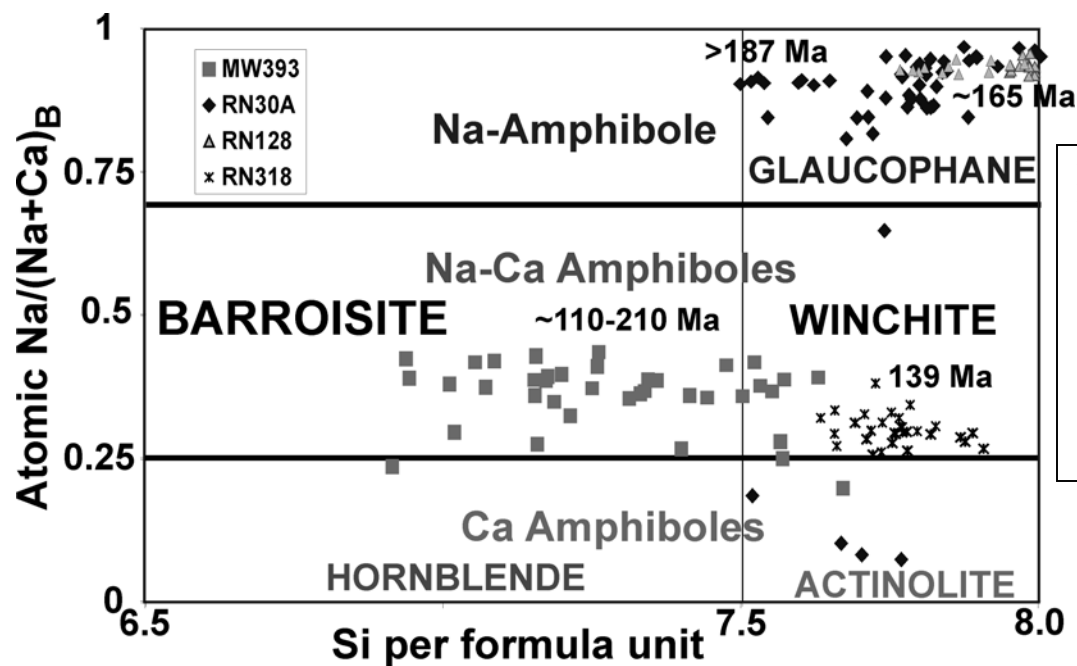


Figure 2. Major element compositional variations in dated amphiboles

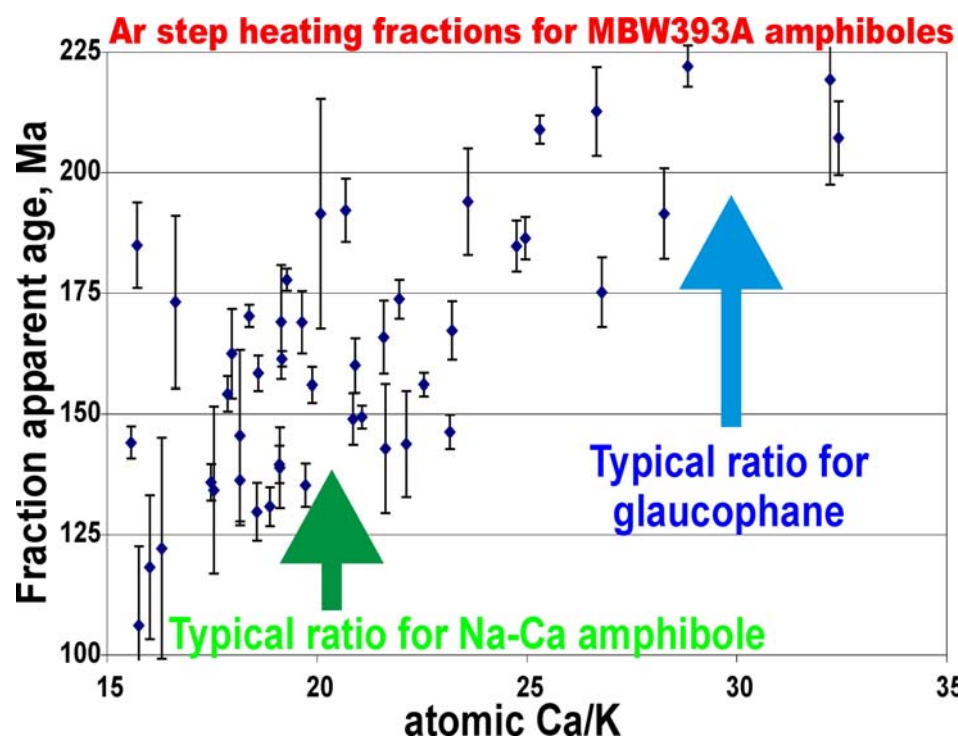


Figure 3. Apparent age vs. Ca/K ratio for higher-quality fractions from repeated runs of sample MW 393. The data can be modeled as a simple mixture of remnant glaucophane (age ~ 210 Ma) and younger barroisite (age ~ 135 Ma).

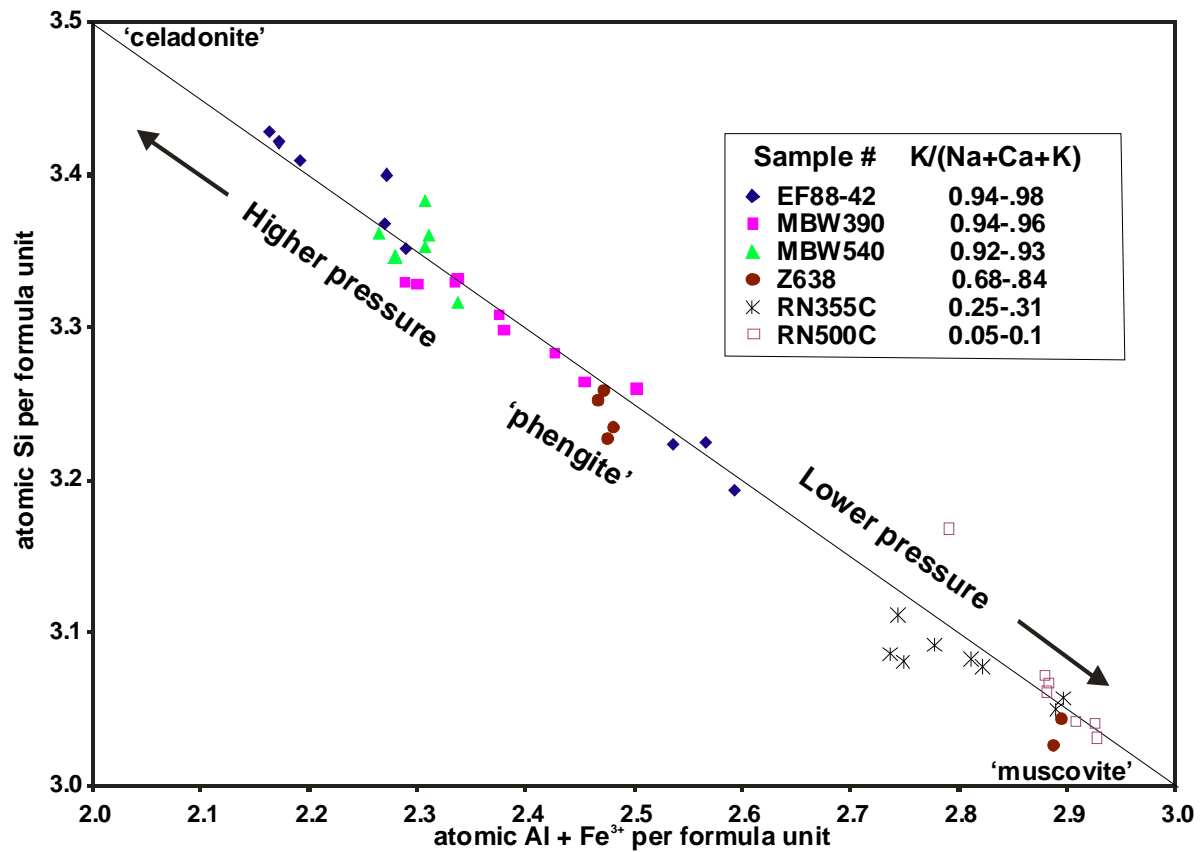
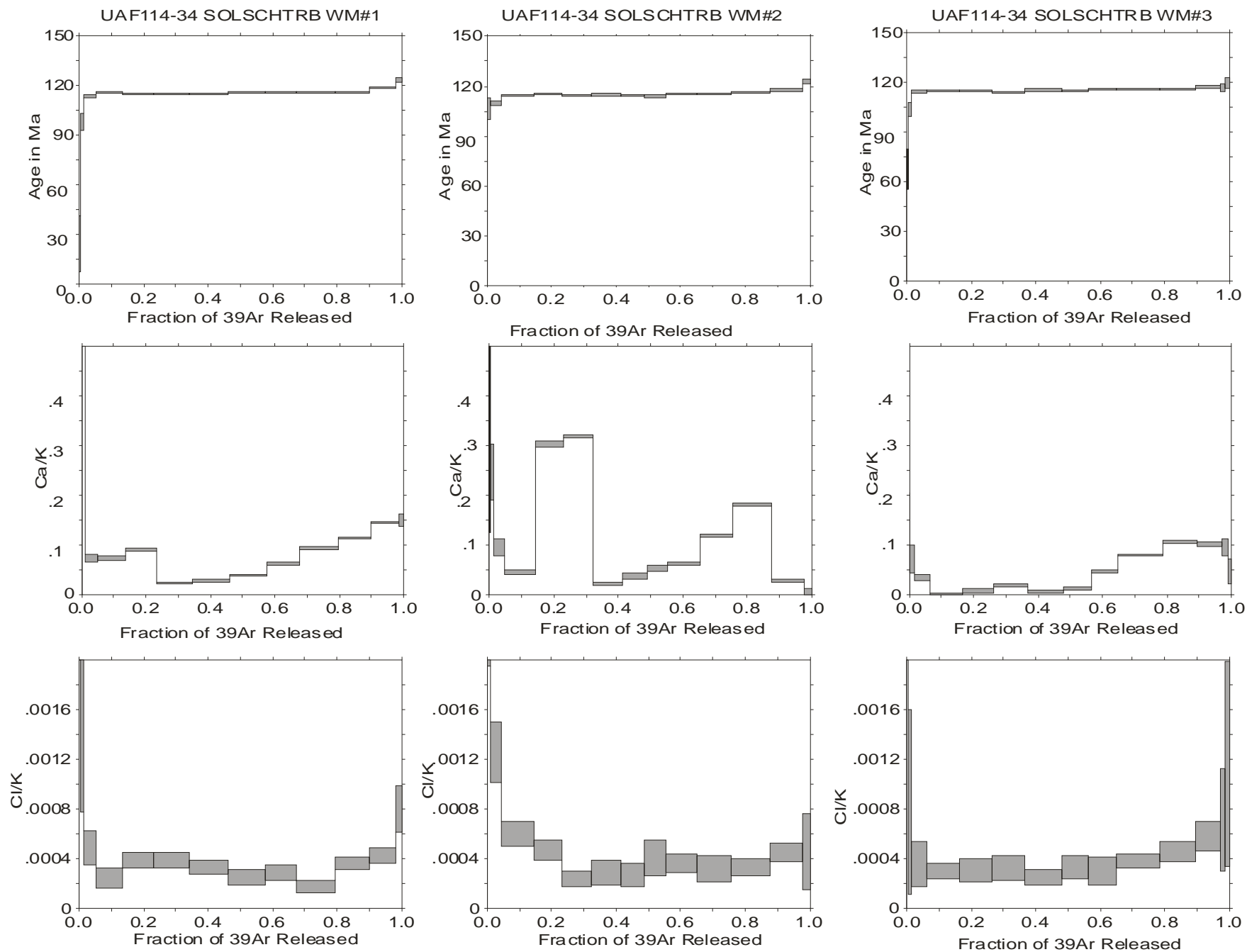
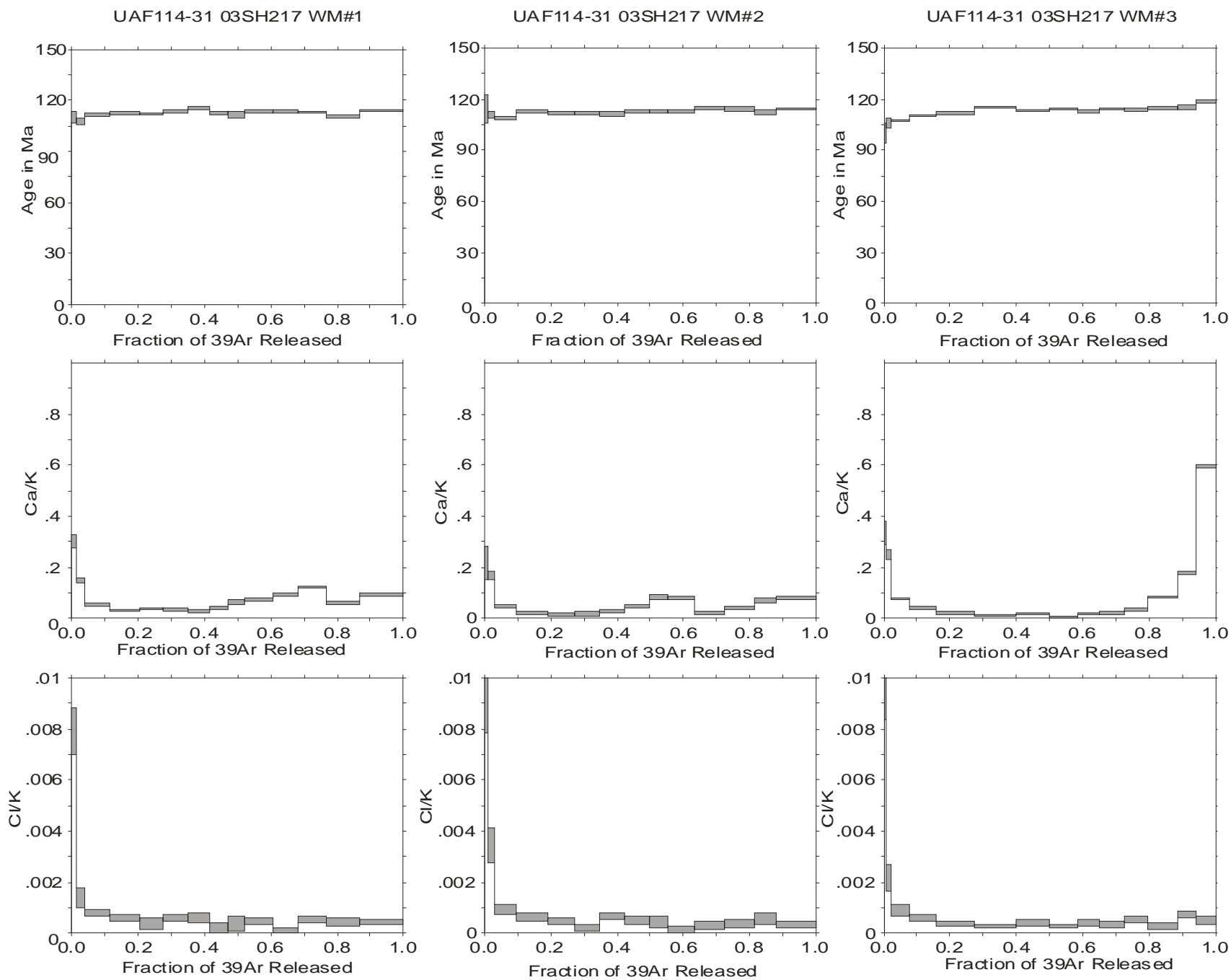


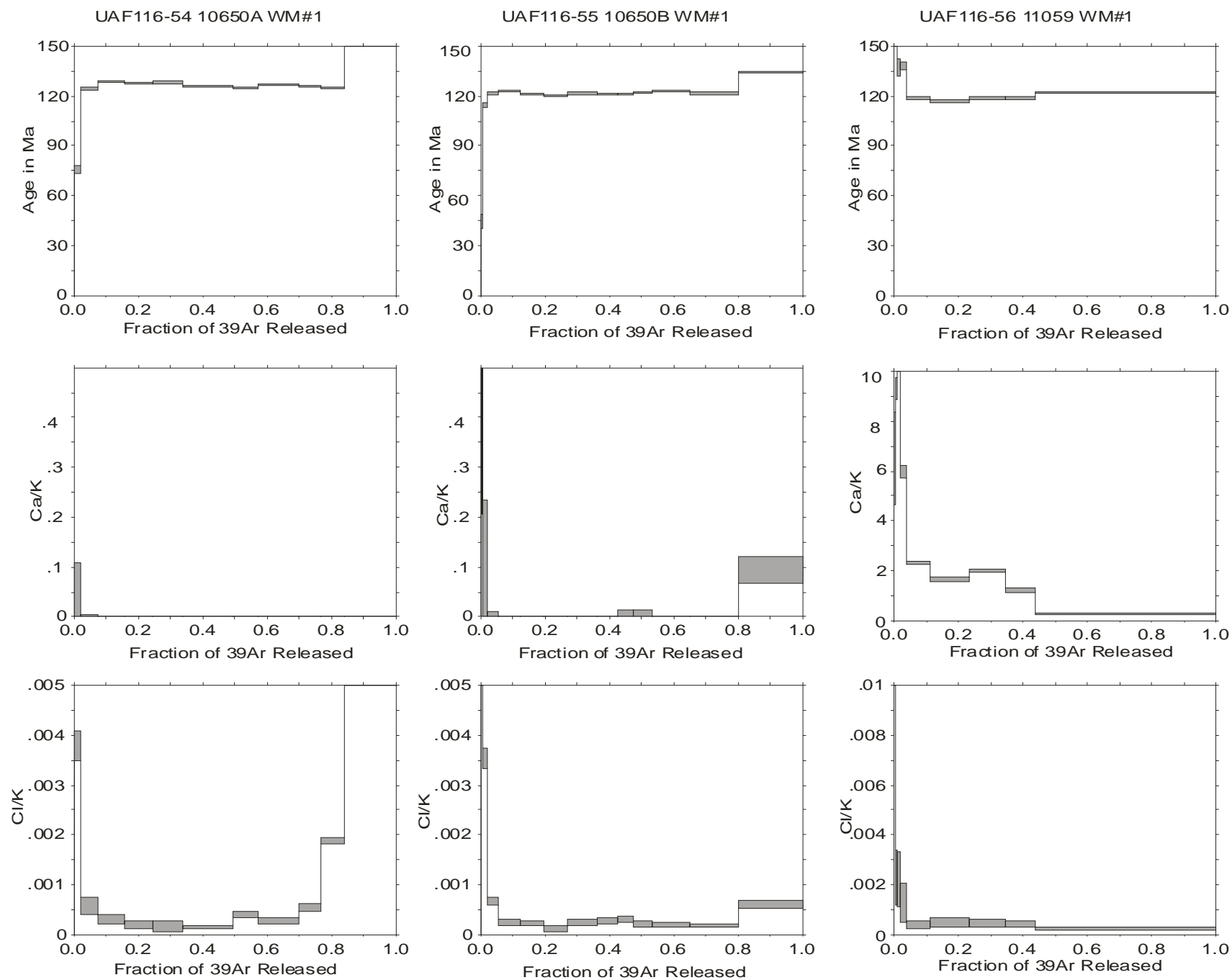
Fig. 4. Compositions of representative dated white micas expressed as Si and Al+Fe³⁺ pfu, i.e., Showing celadonite-muscovite solid solution. Micas with ~ 3 Si and Al+Fe³⁺ pfu are ~ muscovite/paragonite composition and (re)crystallized at low pressure. Higher pressure micas display high celadonite components. Mica ages (see spectra) thus reflect metamorphic and (or) vein conditions, depending on the mica composition.

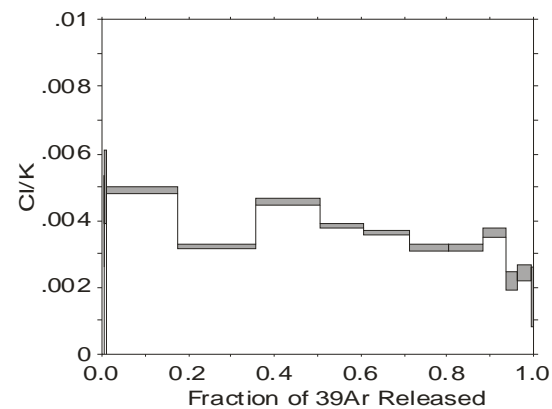
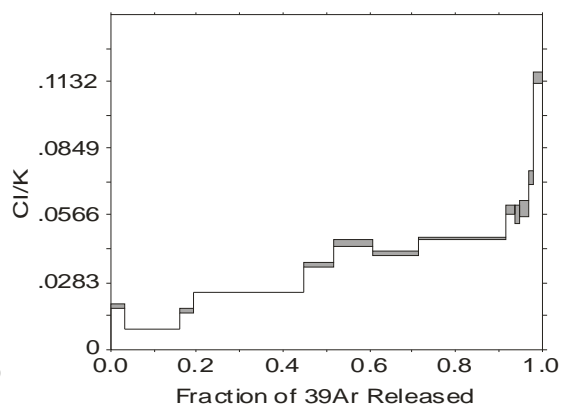
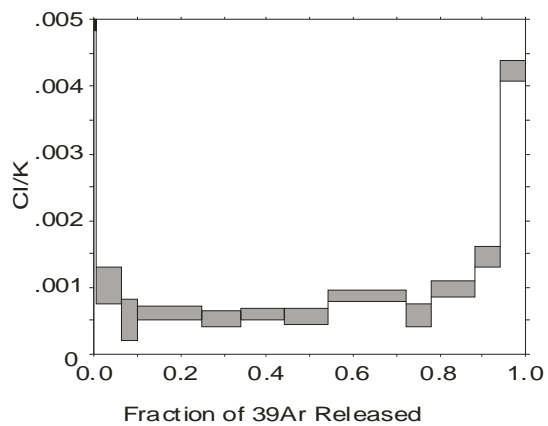
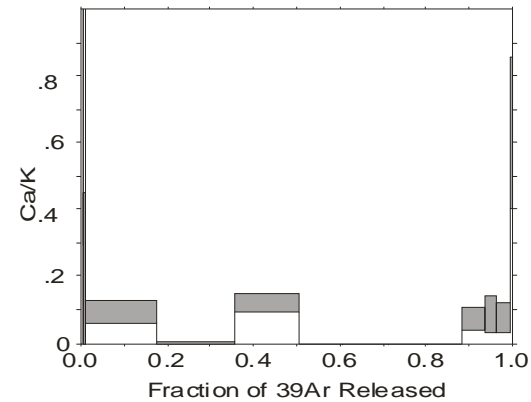
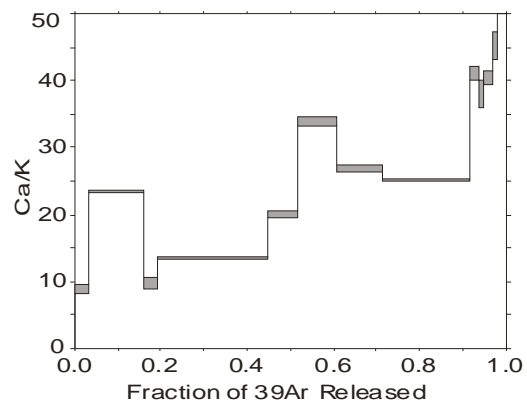
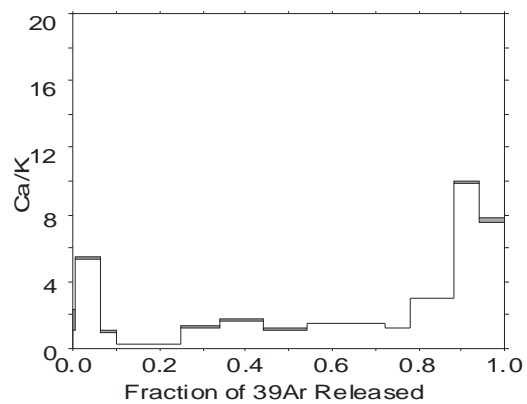
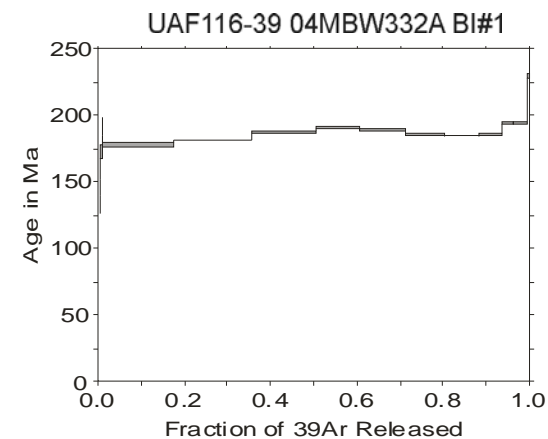
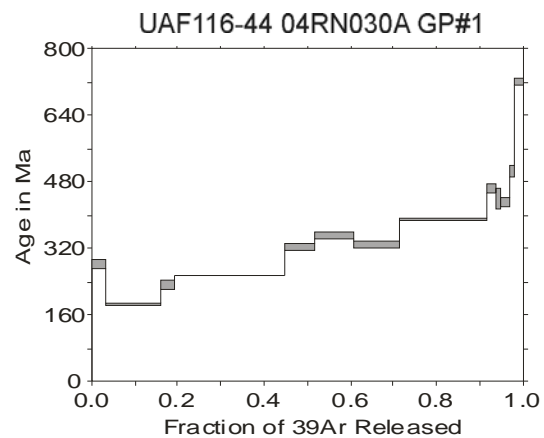
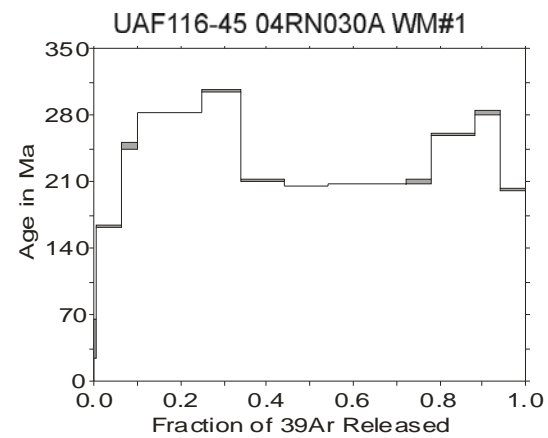
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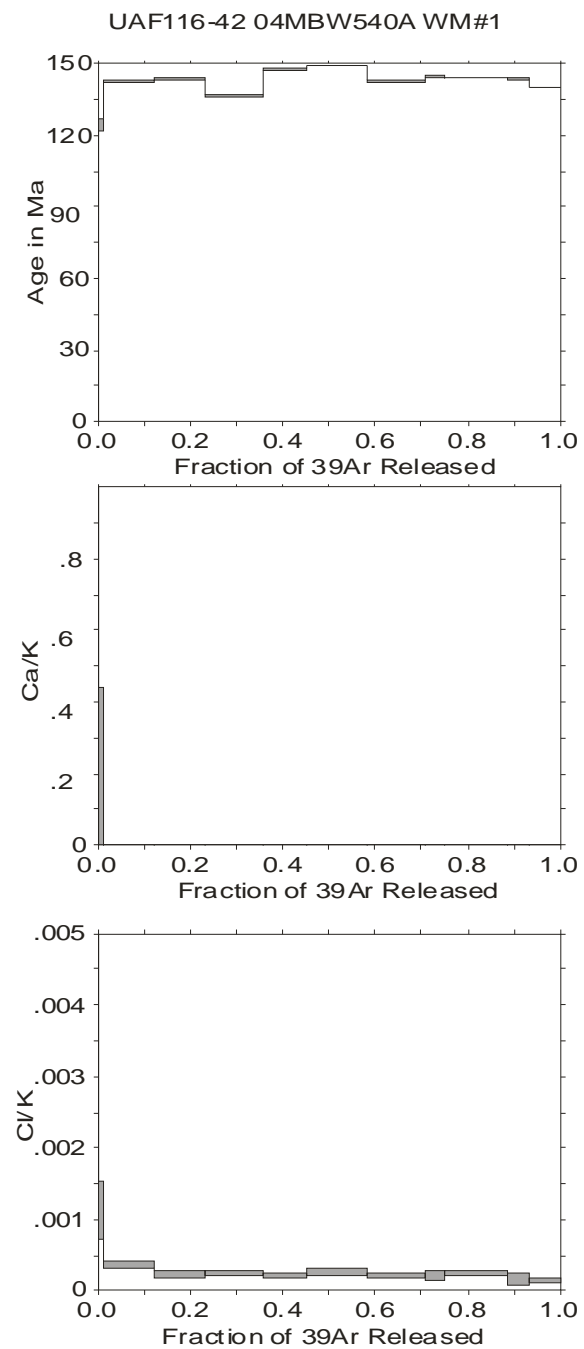
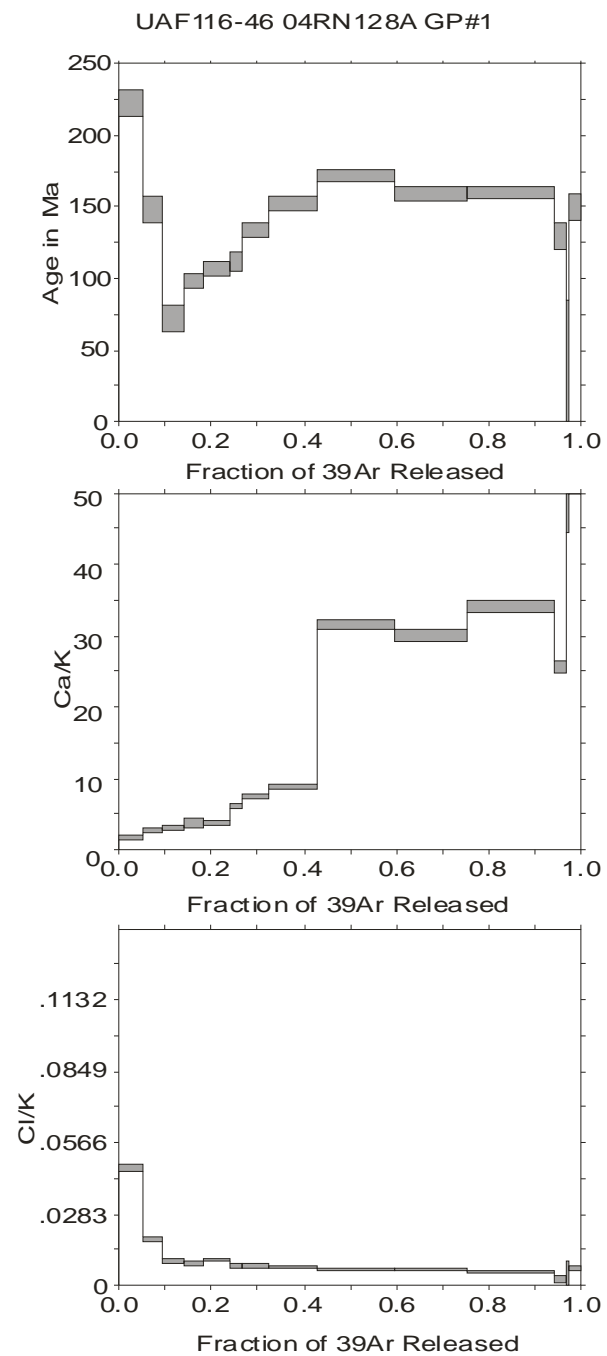
Age, Ca/K and Cl/K spectra plots

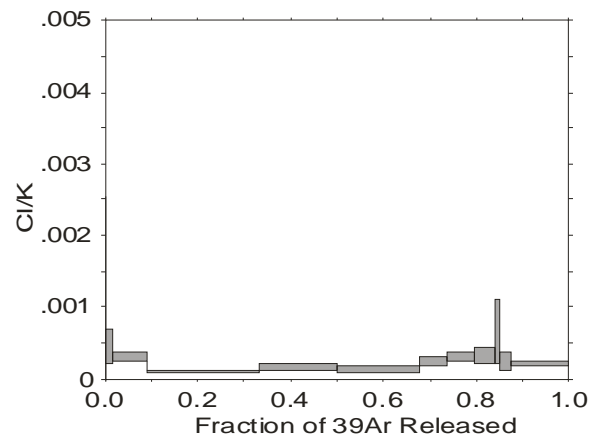
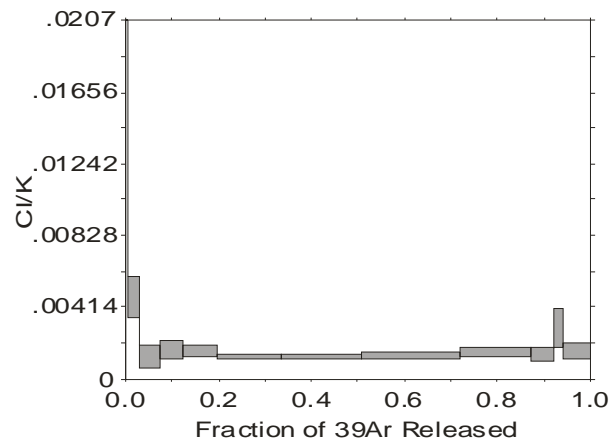
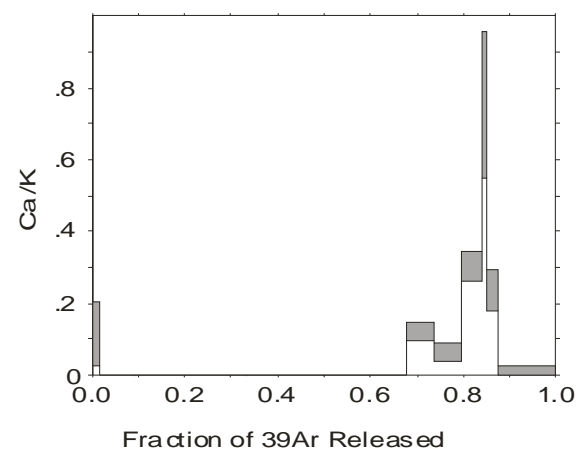
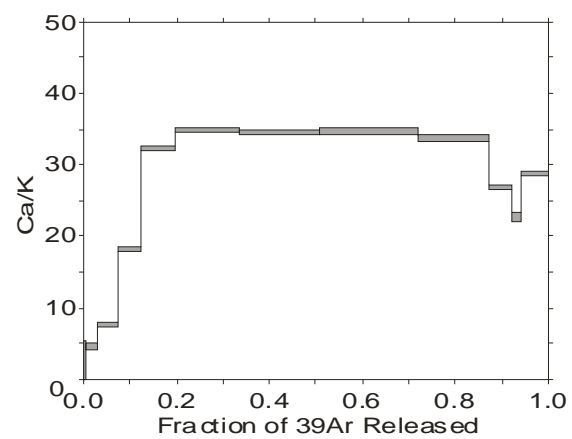
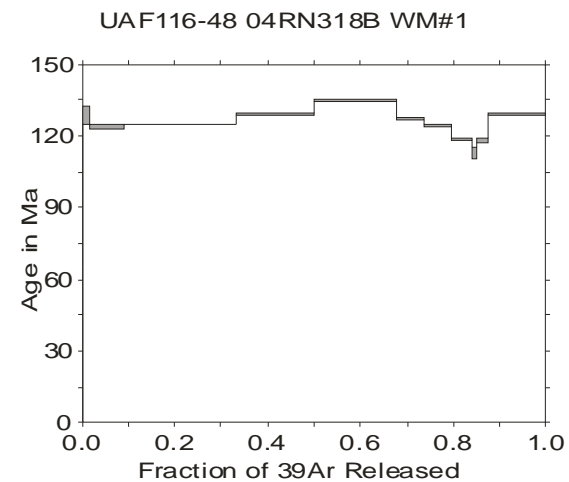
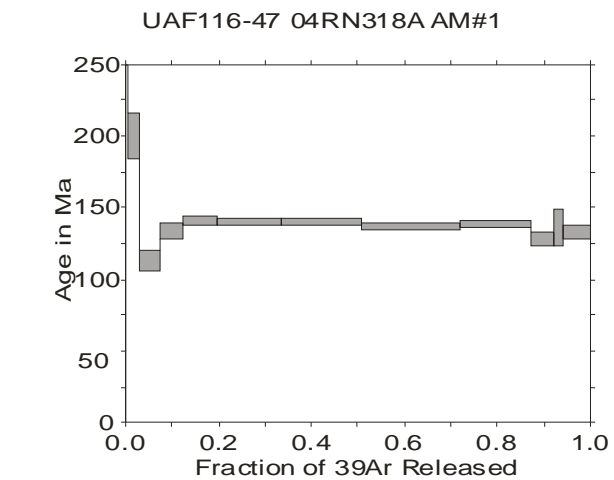


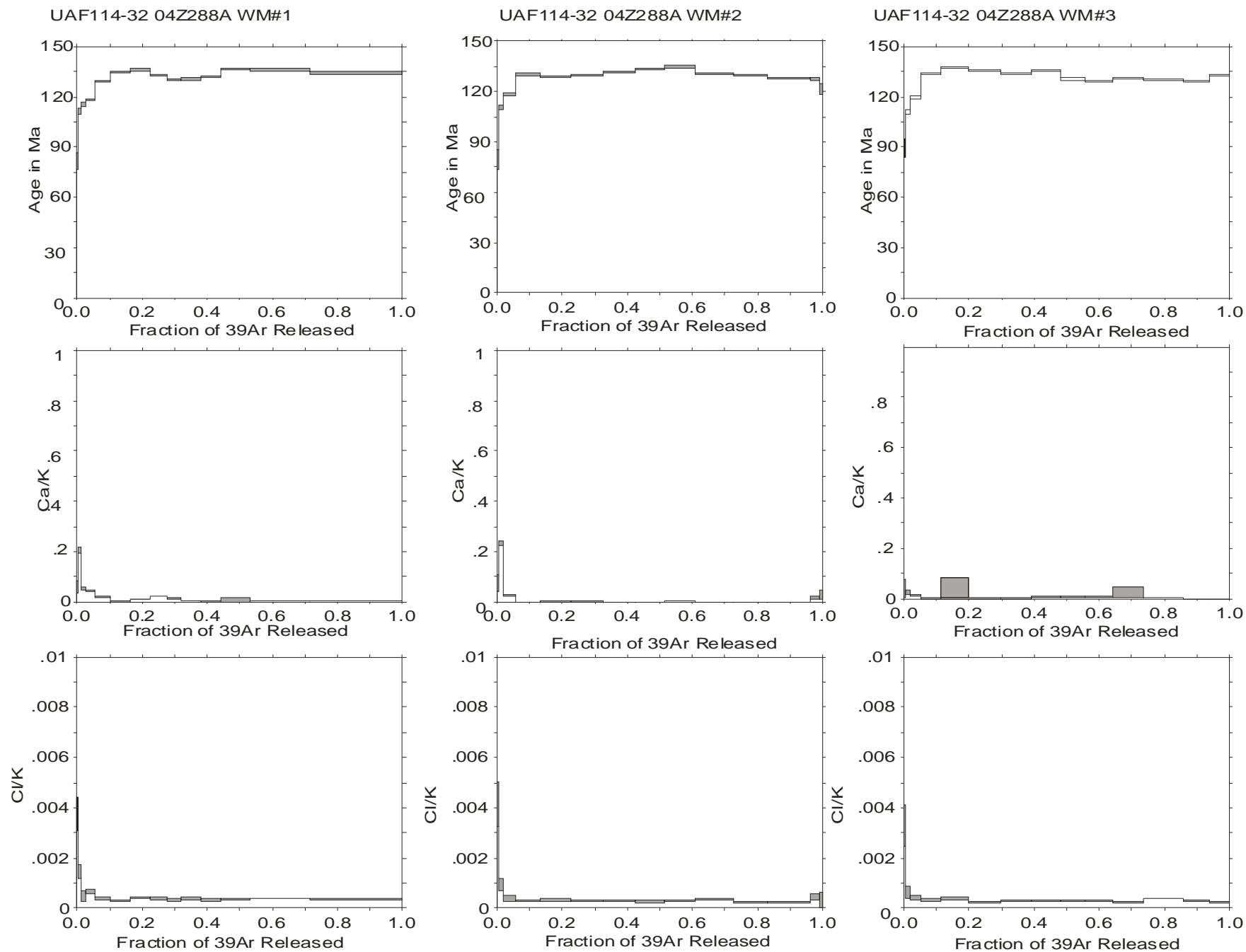


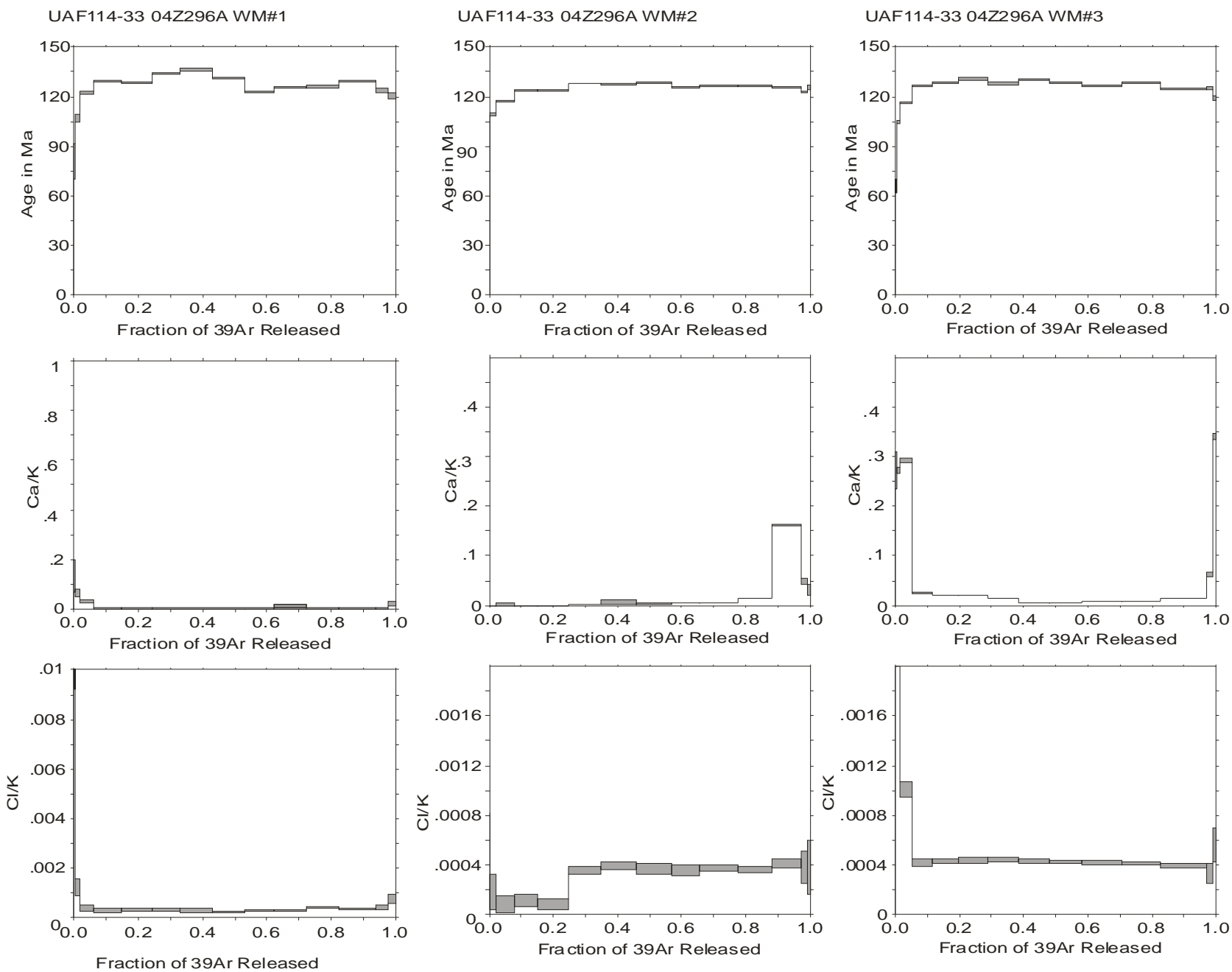


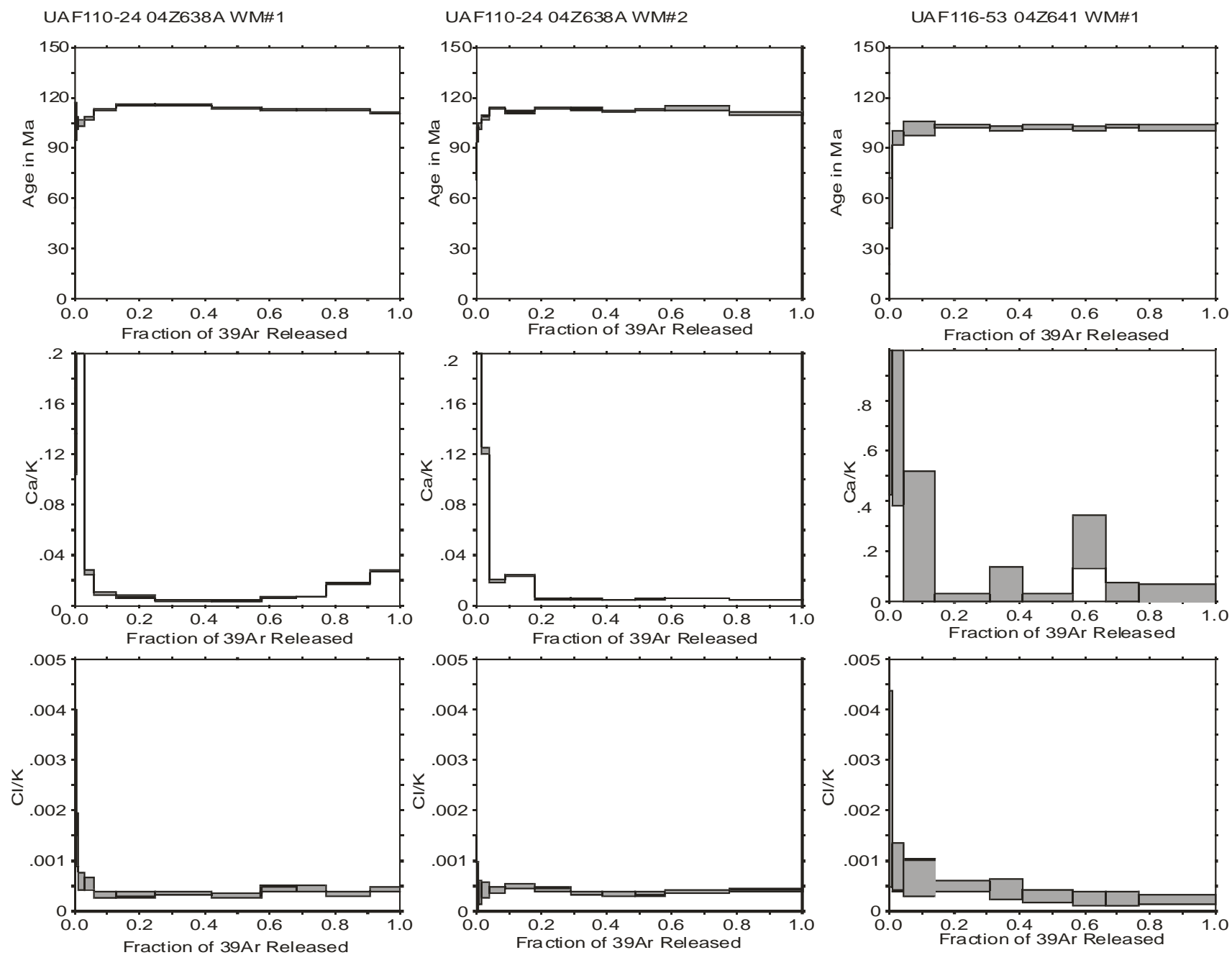


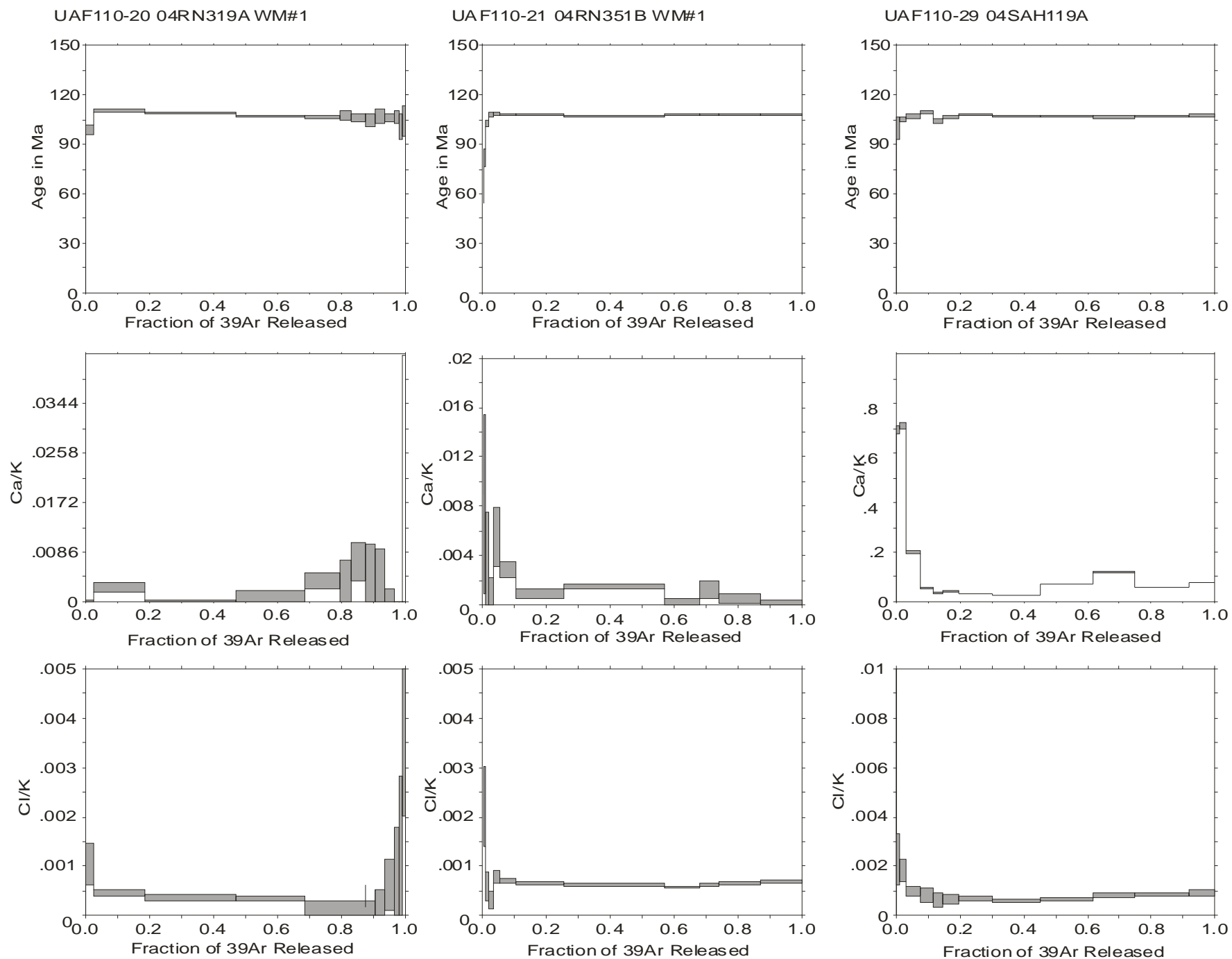


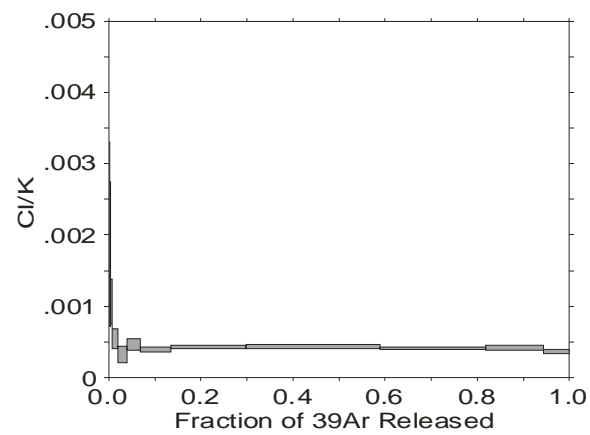
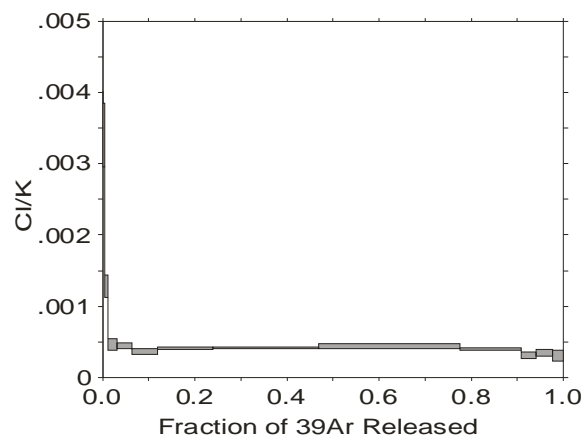
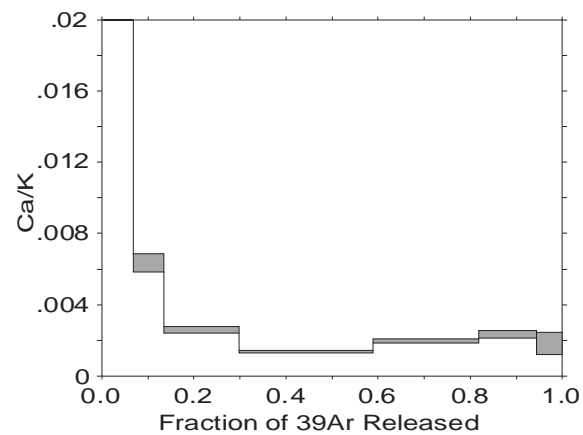
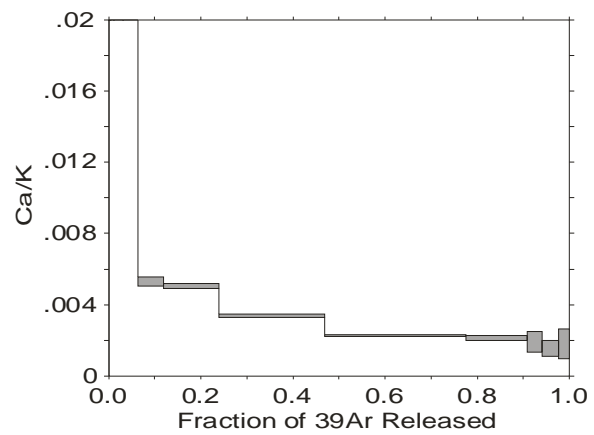
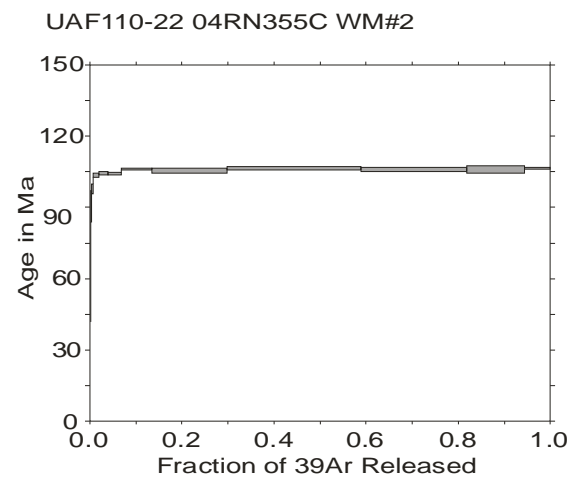
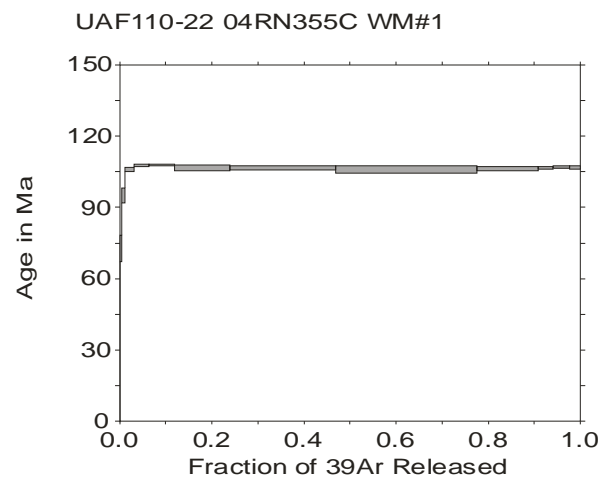


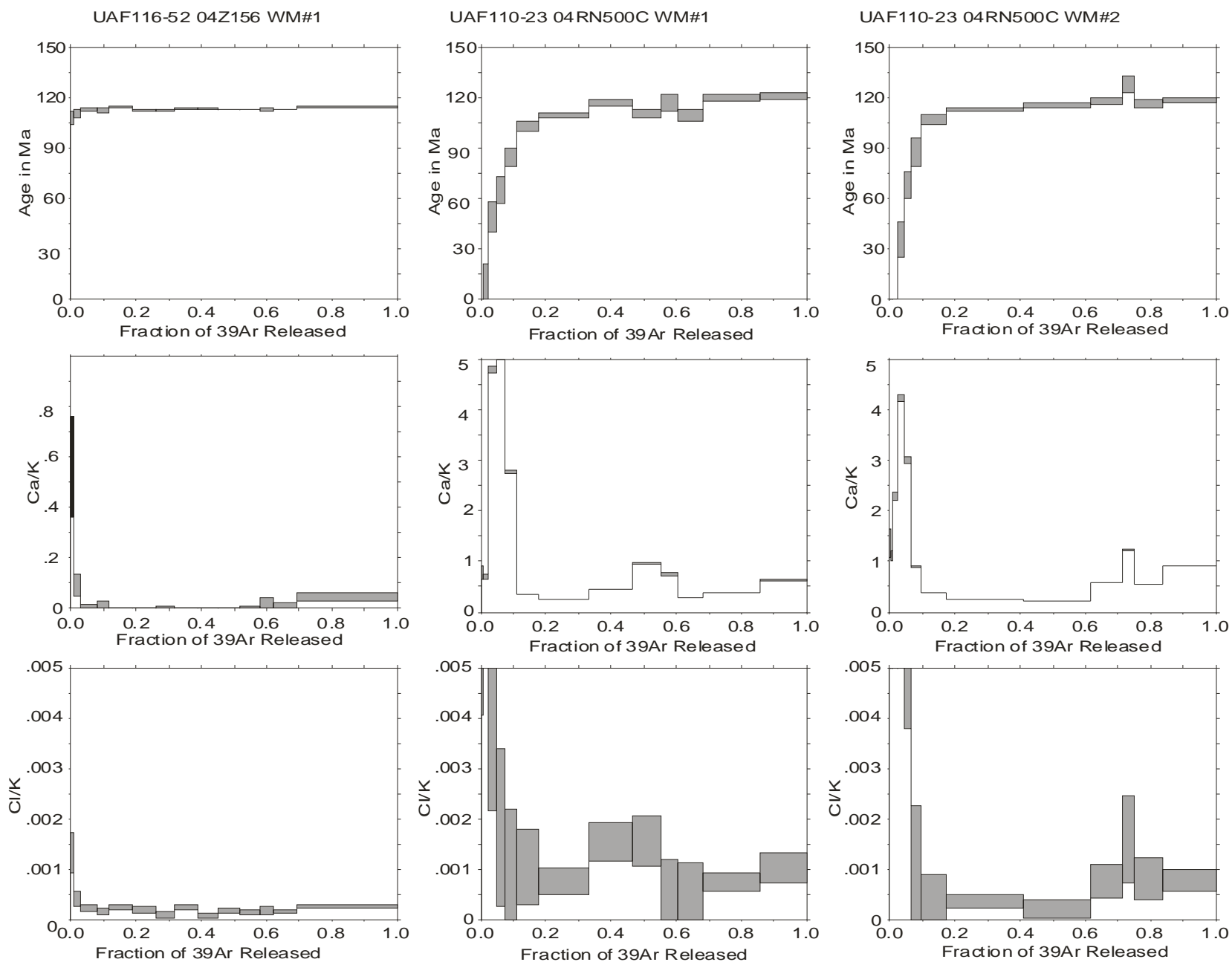


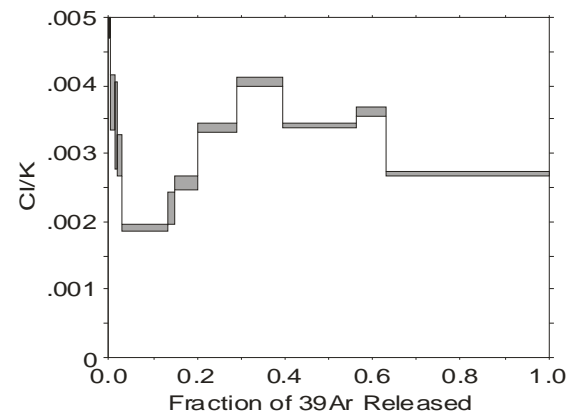
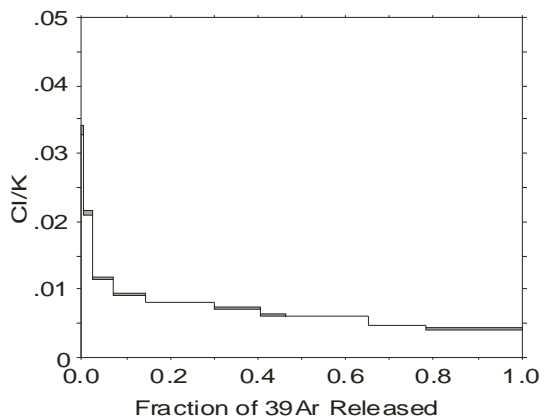
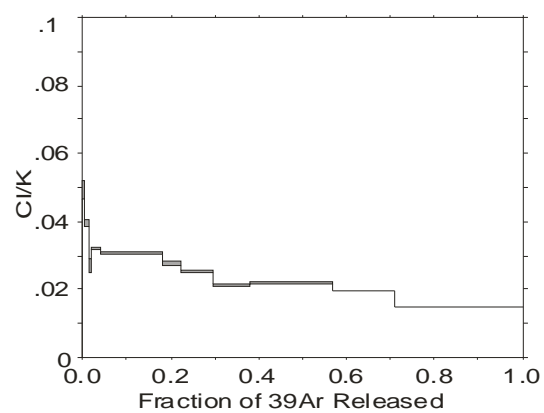
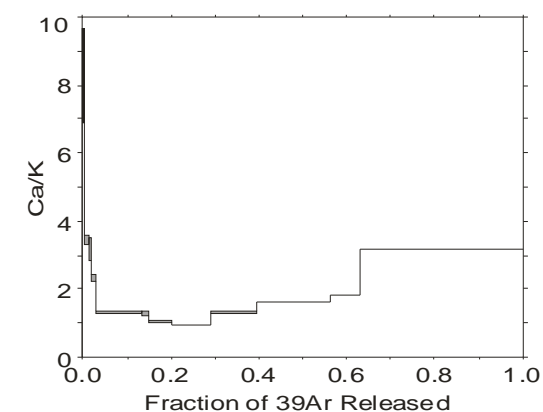
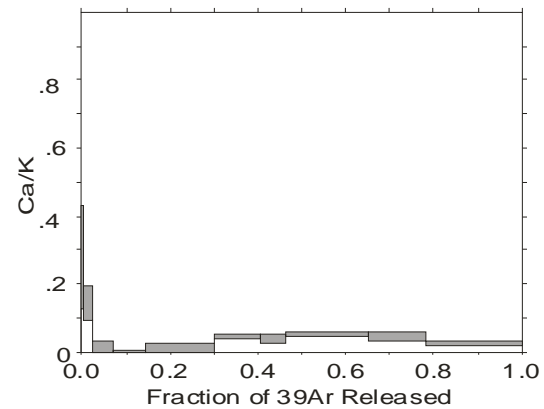
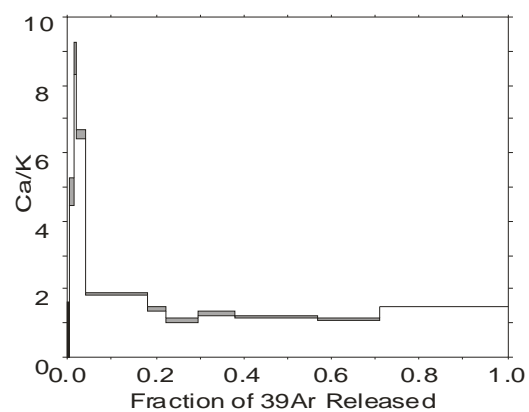
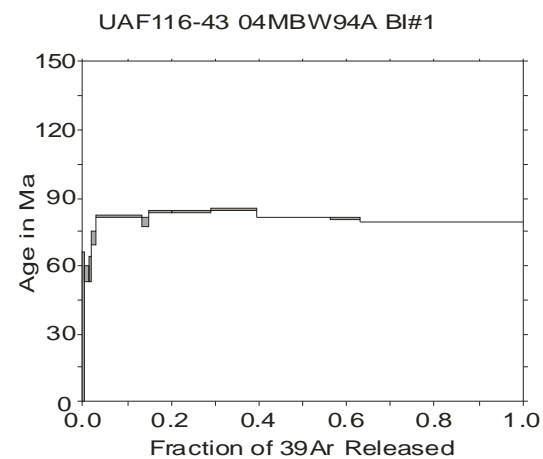
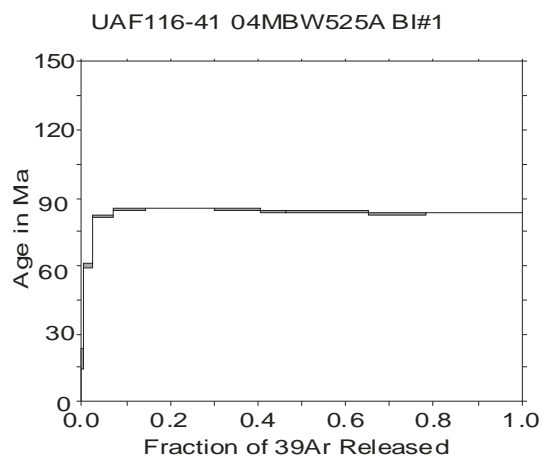
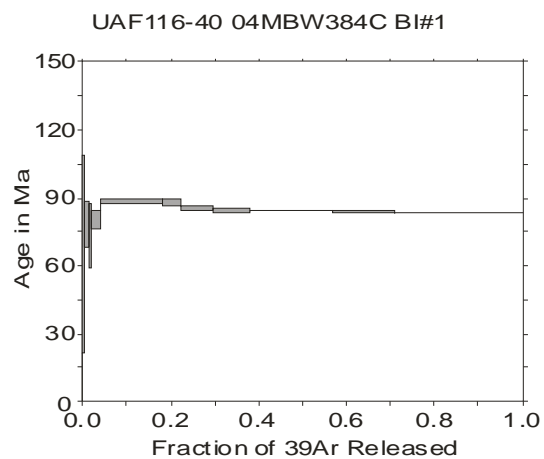








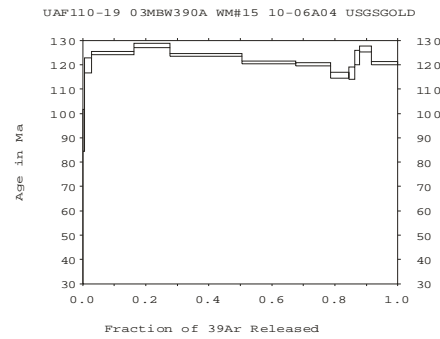
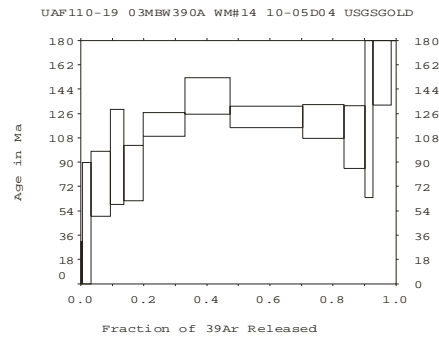
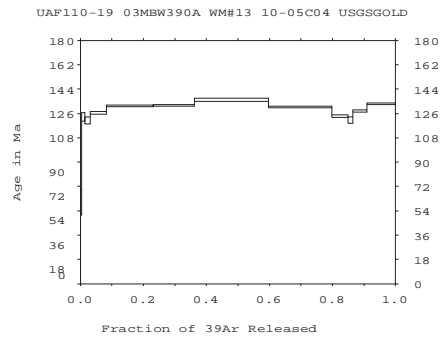
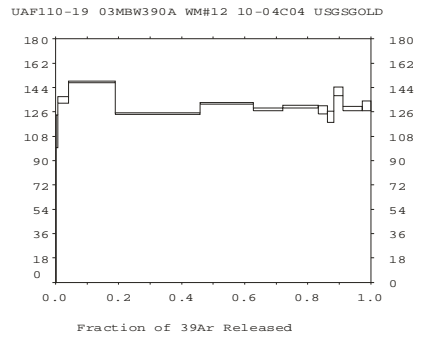
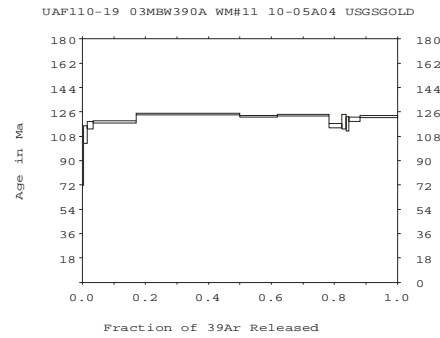
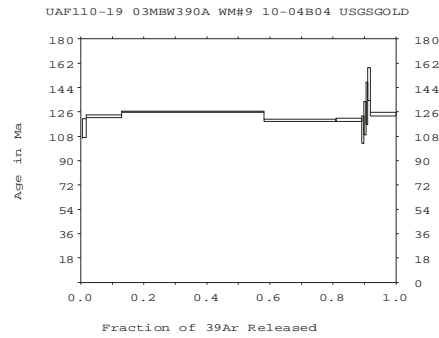
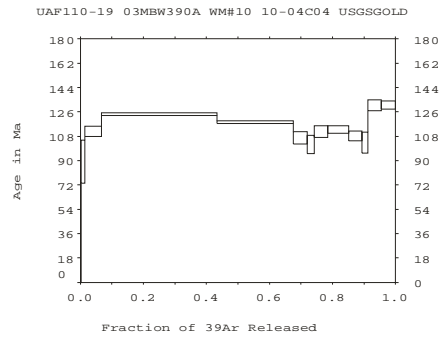
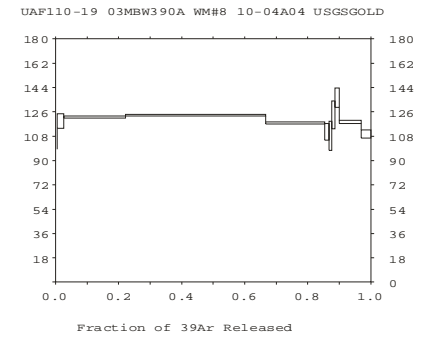
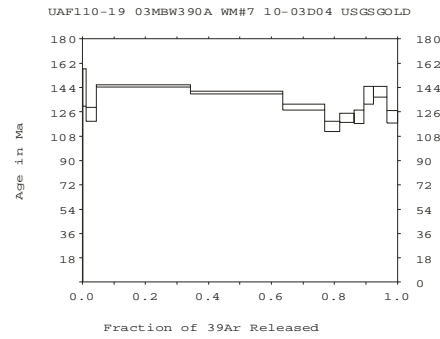
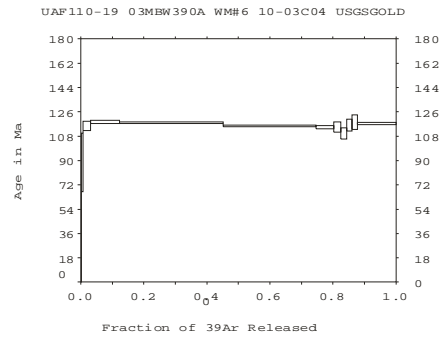
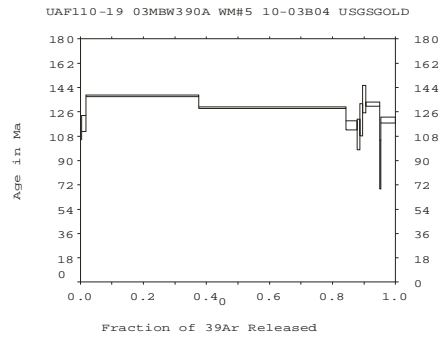
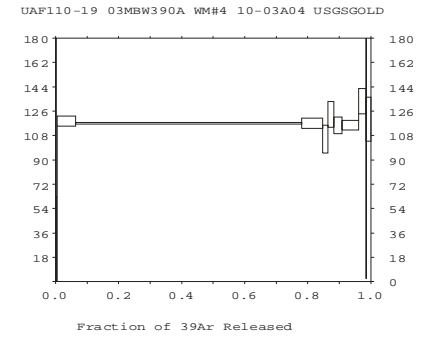
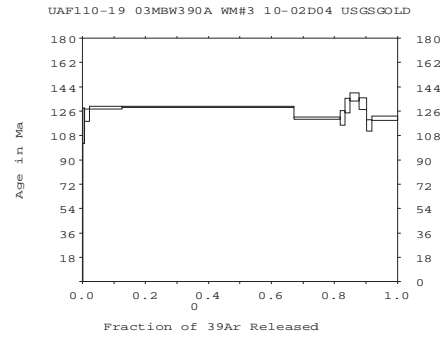
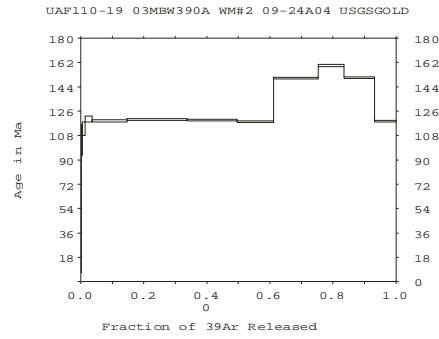
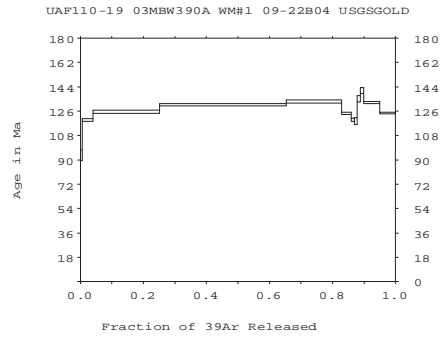




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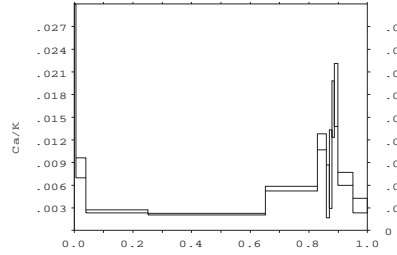
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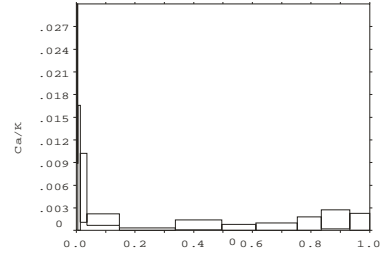
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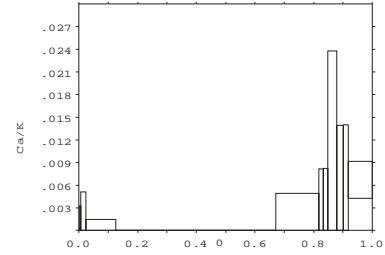
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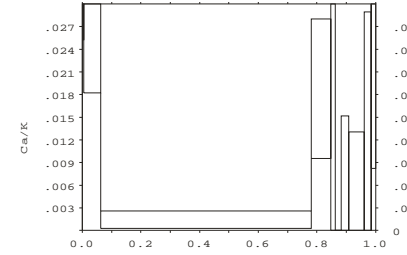
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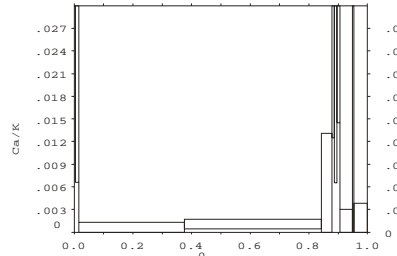
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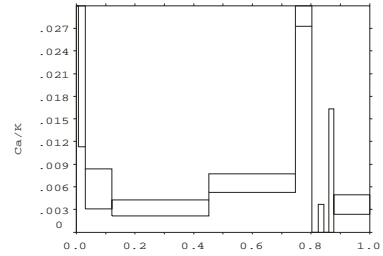
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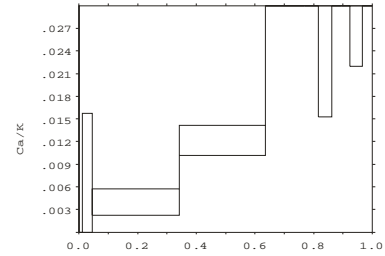
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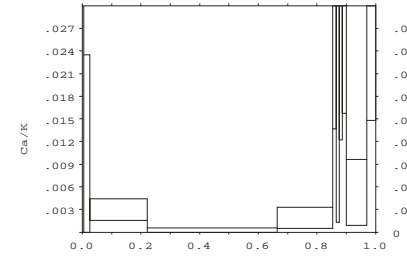
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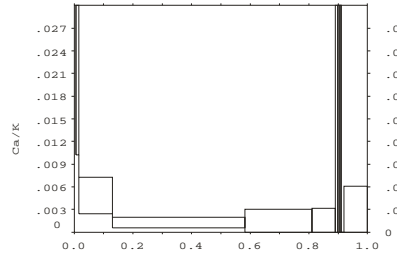
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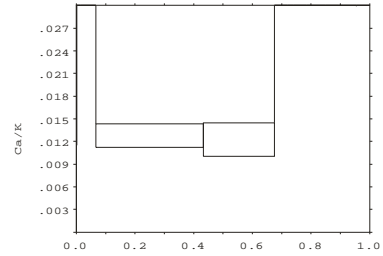
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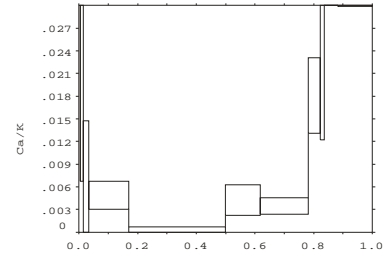
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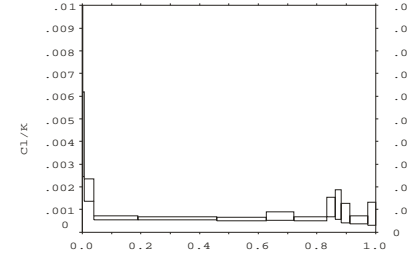
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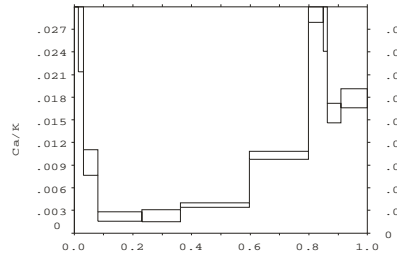
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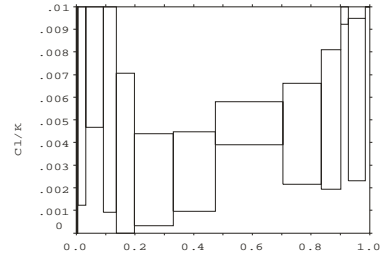
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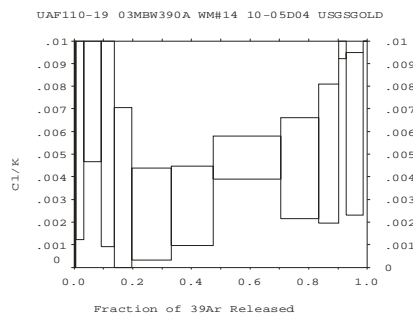
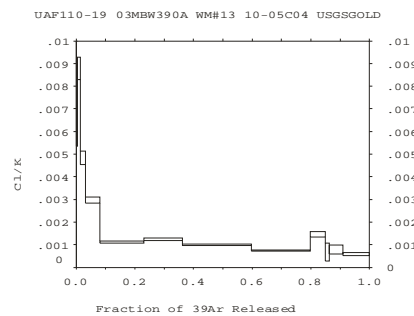
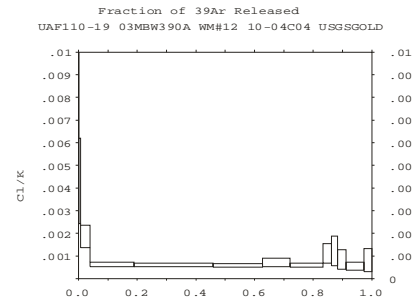
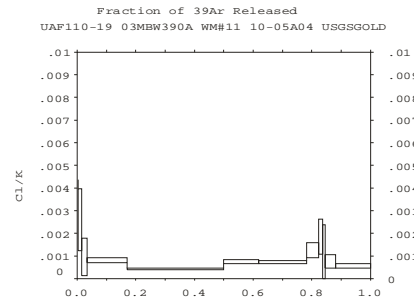
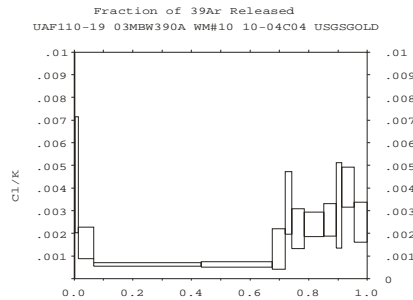
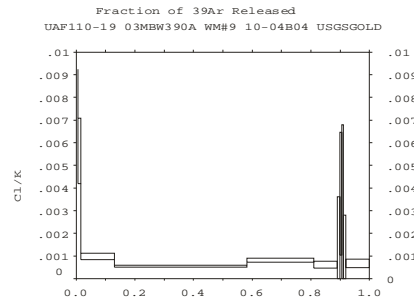
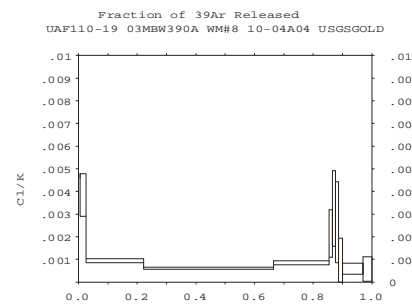
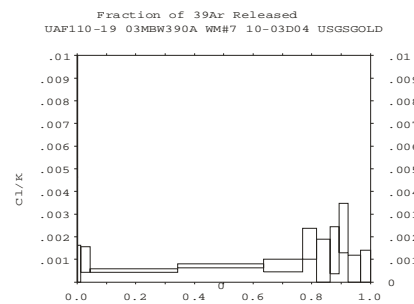
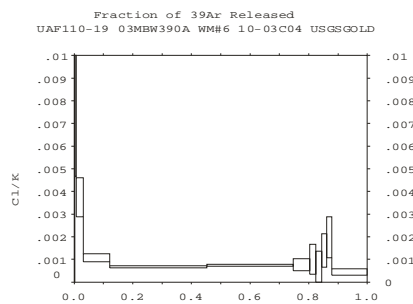
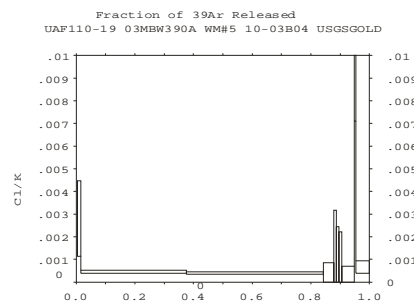
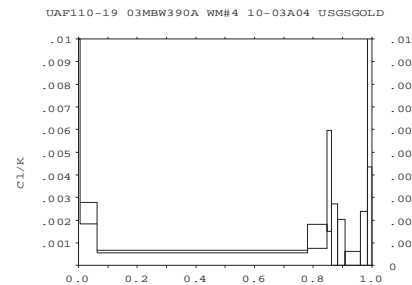
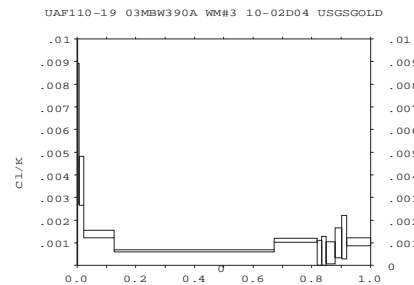
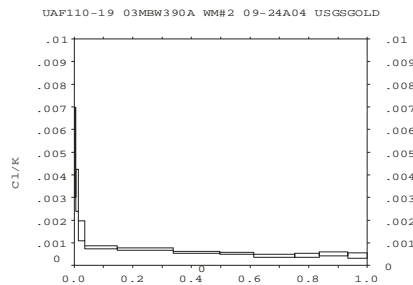
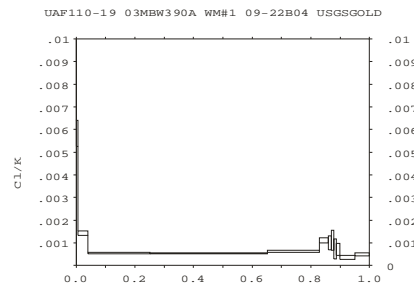


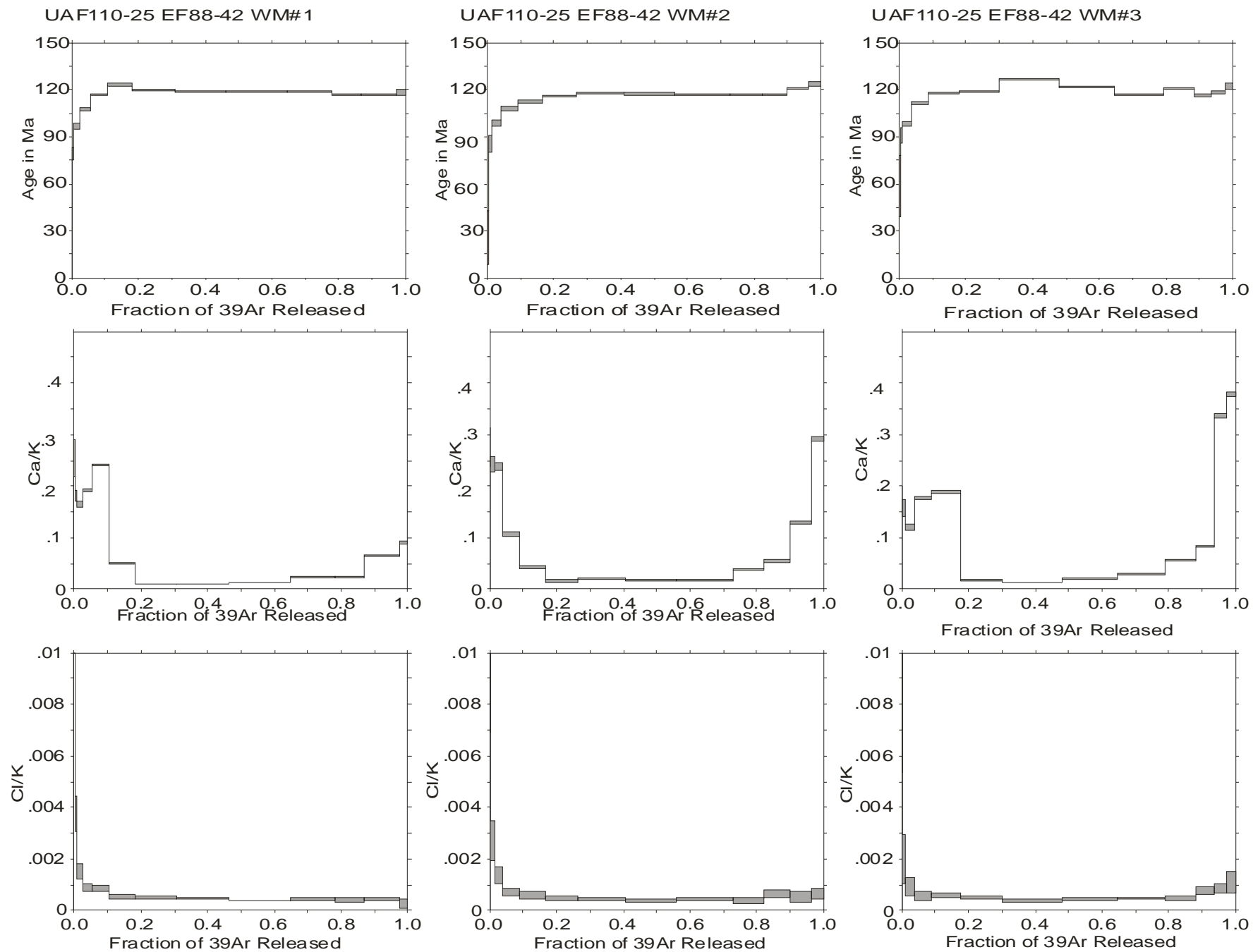
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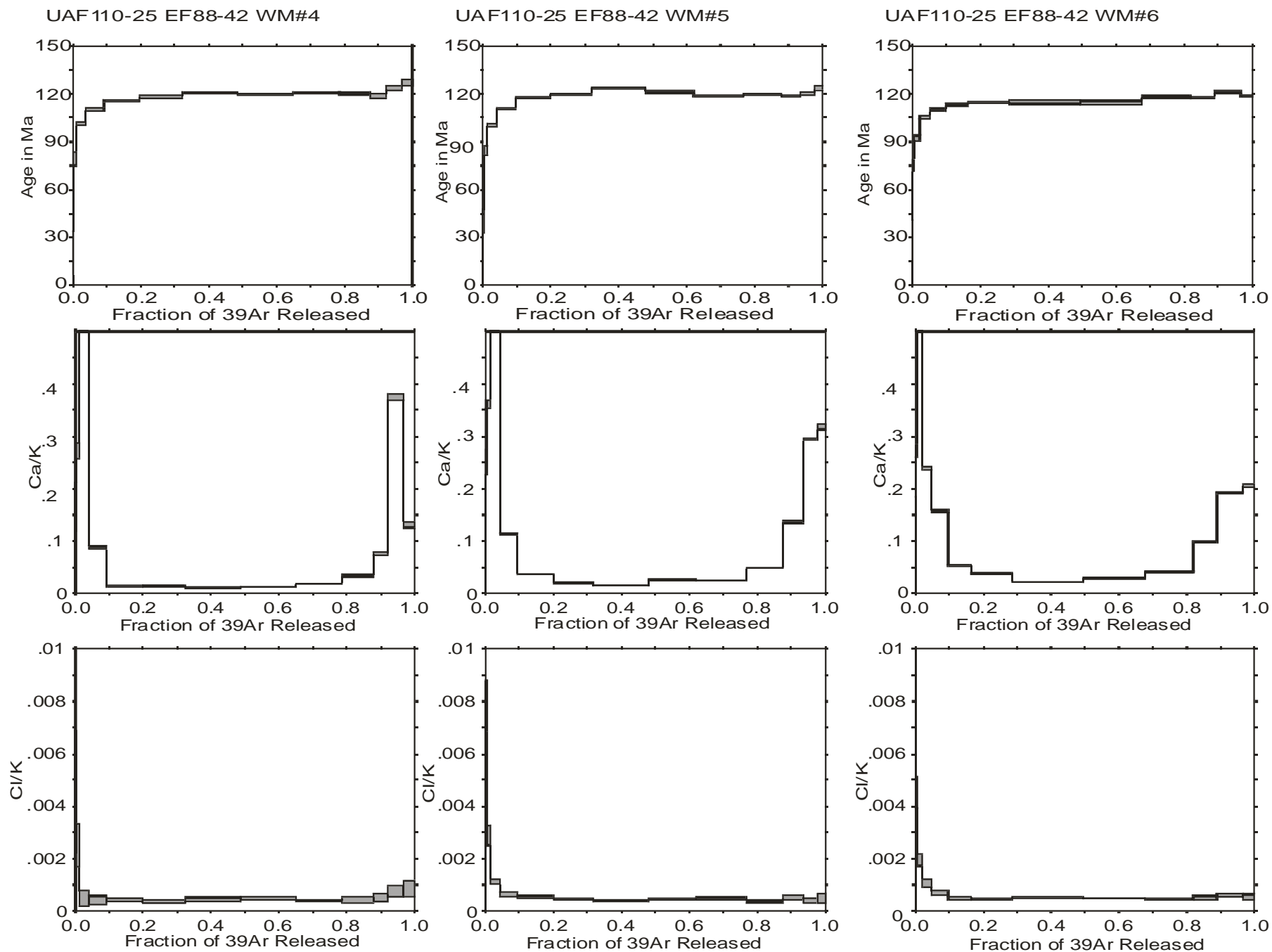
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Appendix 2:

Geochronologic data

Data table for USGS Gold project

UAF114-34 SOLSCHTRB WM#1 03-31E05 USGSGOLD

Weighted average of J from standards = 0.002476 +/- 0.000006

Laser (mW)	Cum. ³⁹ Ar	⁴⁰ Ar/ ³⁹ Ar measured	+/-	³⁷ Ar/ ³⁹ Ar measured	+/-	³⁶ Ar/ ³⁹ Ar measured	+/-	% Atm. ⁴⁰ Ar	Ca/K	+/-	Cl/K	+/-	⁴⁰ Ar*/ ³⁹ Ar _K	+/-	Age (Ma)	+/- (Ma)
200	0.0022	39.367	0.423	0.22441	0.06604	0.11479	0.01309	86.2	0.41182	0.12120	0.01763	0.00272	5.436	3.856	24.1	17.0
400	0.0115	29.859	0.131	0.55773	0.01499	0.02527	0.00400	24.9	1.02373	0.02753	0.00153	0.00075	22.414	1.188	97.5	5.0
600	0.0508	27.600	0.094	0.03997	0.00397	0.00467	0.00051	5.0	0.07335	0.00729	0.00049	0.00014	26.196	0.176	113.4	0.7
800	0.1356	26.858	0.105	0.03984	0.00213	0.00067	0.00029	0.7	0.07311	0.00392	0.00025	0.00008	26.634	0.136	115.2	0.6
1000	0.2318	26.827	0.090	0.04898	0.00159	0.00108	0.00022	1.2	0.08987	0.00291	0.00039	0.00006	26.483	0.110	114.6	0.5
1250	0.3432	26.898	0.082	0.01288	0.00127	0.00109	0.00022	1.2	0.02363	0.00232	0.00039	0.00007	26.548	0.104	114.9	0.4
1500	0.4611	26.676	0.079	0.01533	0.00118	0.00043	0.00022	0.5	0.02814	0.00216	0.00033	0.00006	26.521	0.102	114.8	0.4
1750	0.5767	26.778	0.087	0.02117	0.00132	0.00010	0.00022	0.1	0.03884	0.00243	0.00025	0.00006	26.722	0.109	115.6	0.5
2000	0.6751	26.810	0.098	0.03377	0.00168	0.00045	0.00027	0.5	0.06197	0.00308	0.00029	0.00006	26.652	0.126	115.3	0.5
2500	0.7948	26.796	0.081	0.05094	0.00148	0.00009	0.00025	0.1	0.09346	0.00272	0.00018	0.00005	26.744	0.110	115.7	0.5
3000	0.9003	26.922	0.086	0.06266	0.00107	0.00073	0.00021	0.8	0.11498	0.00196	0.00036	0.00005	26.684	0.105	115.4	0.4
4000	0.9833	27.665	0.099	0.07893	0.00111	0.00126	0.00024	1.3	0.14483	0.00204	0.00043	0.00006	27.272	0.122	117.9	0.5
5000	1.0000	29.835	0.091	0.08084	0.00679	0.00433	0.00121	4.3	0.14833	0.01245	0.00080	0.00019	28.534	0.367	123.2	1.5
Integrated		27.024	0.028	0.04497	0.00052	0.00132	0.00009	1.4	0.08251	0.00096	0.00038	0.00002	26.609	0.039	115.1	0.3

UAF114-34 SOLSCHTRB WM#2 004-01C05 USGSGOLD

Weighted average of J from standards = 0.002476 +/- 0.000006

Laser (mW)	Cum. ³⁹ Ar	⁴⁰ Ar/ ³⁹ Ar measured	+/-	³⁷ Ar/ ³⁹ Ar measured	+/-	³⁶ Ar/ ³⁹ Ar measured	+/-	% Atm. ⁴⁰ Ar	Ca/K	+/-	Cl/K	+/-	⁴⁰ Ar*/ ³⁹ Ar _K	+/-	Age (Ma)	+/- (Ma)
200	0.0021	40.381	1.238	0.18762	0.11966	0.08187	0.01861	59.9	0.34429	0.21961	0.01673	0.00399	16.176	5.473	70.9	23.5
400	0.0109	29.765	0.260	0.13449	0.03014	0.01784	0.00528	17.7	0.24680	0.05530	0.00301	0.00106	24.475	1.576	106.2	6.6
600	0.0455	27.251	0.126	0.05173	0.00884	0.00631	0.00102	6.8	0.09492	0.01623	0.00125	0.00024	25.364	0.324	109.9	1.4
800	0.1429	26.836	0.090	0.02429	0.00265	0.00115	0.00043	1.3	0.04457	0.00487	0.00060	0.00010	26.469	0.156	114.5	0.7
1000	0.2297	26.872	0.095	0.16432	0.00331	0.00066	0.00042	0.7	0.30154	0.00608	0.00047	0.00008	26.664	0.157	115.3	0.7
1250	0.3230	26.773	0.076	0.17357	0.00172	0.00082	0.00034	0.9	0.31852	0.00315	0.00024	0.00007	26.517	0.125	114.7	0.5
1500	0.4135	26.844	0.087	0.01185	0.00194	0.00083	0.00035	0.9	0.02173	0.00357	0.00029	0.00010	26.571	0.136	115.0	0.6
1750	0.4891	26.813	0.113	0.02050	0.00304	0.00131	0.00043	1.4	0.03762	0.00558	0.00028	0.00009	26.400	0.170	114.2	0.7
2000	0.5534	26.830	0.093	0.02893	0.00274	0.00165	0.00077	1.8	0.05308	0.00503	0.00041	0.00014	26.315	0.246	113.9	1.0
2500	0.6526	26.817	0.096	0.03362	0.00166	0.00070	0.00034	0.8	0.06170	0.00305	0.00036	0.00007	26.583	0.138	115.0	0.6

3000	0.7560	26.877	0.066	0.06508	0.00136	0.00035	0.00030	0.4	0.11942	0.00250	0.00032	0.00010	26.752	0.111	115.7	0.5
4000	0.8761	27.134	0.091	0.09904	0.00159	0.00084	0.00026	0.9	0.18174	0.00292	0.00033	0.00007	26.868	0.119	116.2	0.5
5000	0.9770	27.725	0.083	0.01470	0.00170	0.00171	0.00051	1.8	0.02698	0.00312	0.00045	0.00008	27.191	0.172	117.6	0.7
8000	1.0000	29.809	0.143	-0.00116	0.00718	0.00427	0.00103	4.2	-0.00212	0.01317	0.00046	0.00031	28.518	0.335	123.1	1.4
Integrated		27.097	0.027	0.06410	0.00081	0.00155	0.00014	1.7	0.11762	0.00149	0.00047	0.00003	26.615	0.050	115.1	0.4

UAF114-34 SOLSCHTRB WM#3 04-02A05 USGSGOLD

Weighted average of J from standards = 0.002476 +/- 0.000006

Laser (mW)	Cum. ³⁹ Ar	⁴⁰ Ar/ ³⁹ Ar measured	+/-	³⁷ Ar/ ³⁹ Ar measured	+/-	³⁶ Ar/ ³⁹ Ar measured	+/-	% Atm. ⁴⁰ Ar	Ca/K	+/-	Cl/K	+/-	⁴⁰ Ar*/ ³⁹ Ar _K	+/-	Age (Ma)	+/- (Ma)
200	0.0029	36.551	0.514	0.05864	0.05332	0.07144	0.00931	57.8	0.10759	0.09784	0.00688	0.00258	15.417	2.746	67.6	11.8
400	0.0143	29.306	0.162	0.03863	0.01500	0.01855	0.00338	18.7	0.07088	0.02753	0.00086	0.00074	23.799	1.007	103.3	4.3
600	0.0624	27.401	0.082	0.01804	0.00355	0.00343	0.00079	3.7	0.03310	0.00652	0.00035	0.00018	26.360	0.246	114.1	1.0
800	0.1644	26.910	0.081	-0.00078	0.00172	0.00078	0.00033	0.9	-0.00143	0.00316	0.00030	0.00006	26.650	0.127	115.3	0.5
1000	0.2643	26.816	0.098	0.00430	0.00197	0.00080	0.00041	0.9	0.00789	0.00362	0.00031	0.00009	26.552	0.156	114.9	0.7
1250	0.3675	26.676	0.087	0.00965	0.00149	0.00082	0.00040	0.9	0.01771	0.00273	0.00033	0.00009	26.406	0.148	114.3	0.6
1500	0.4805	26.822	0.085	0.00379	0.00154	0.00051	0.00038	0.6	0.00696	0.00283	0.00026	0.00006	26.643	0.139	115.3	0.6
1750	0.5640	26.874	0.108	0.00658	0.00192	0.00103	0.00041	1.1	0.01207	0.00353	0.00034	0.00009	26.542	0.161	114.8	0.7
2000	0.6494	26.896	0.076	0.02546	0.00170	0.00042	0.00033	0.5	0.04672	0.00313	0.00030	0.00011	26.746	0.124	115.7	0.5
2500	0.7867	26.929	0.092	0.04394	0.00106	0.00013	0.00023	0.1	0.08062	0.00195	0.00038	0.00006	26.865	0.114	116.2	0.5
3000	0.8944	26.965	0.077	0.05824	0.00156	0.00028	0.00024	0.3	0.10687	0.00287	0.00046	0.00008	26.859	0.105	116.2	0.4
4000	0.9706	27.467	0.105	0.05529	0.00276	0.00123	0.00049	1.3	0.10146	0.00506	0.00058	0.00012	27.080	0.177	117.1	0.7
5000	0.9886	28.624	0.108	0.05144	0.00955	0.00547	0.00181	5.6	0.09439	0.01753	0.00072	0.00041	26.986	0.545	116.7	2.3
8000	1.0000	32.115	0.188	0.02546	0.01380	0.01476	0.00279	13.6	0.04671	0.02532	0.00117	0.00082	27.728	0.842	119.8	3.5
Integrated		27.082	0.028	0.02371	0.00063	0.00141	0.00013	1.5	0.04351	0.00116	0.00040	0.00003	26.638	0.048	115.2	0.4

UAF114-31 03SH217 WM#1 03-31B05

Weighted average of J from standards = 0.002476 +/- 0.000006

Laser (mW)	Cum. ³⁹ Ar	⁴⁰ Ar/ ³⁹ Ar measured	+/-	³⁷ Ar/ ³⁹ Ar measured	+/-	³⁶ Ar/ ³⁹ Ar measured	+/-	% Atm. ⁴⁰ Ar	Ca/K	+/-	Cl/K	+/-	⁴⁰ Ar*/ ³⁹ Ar _K	+/-	Age (Ma)	+/- (Ma)
200	0.0124	79.506	0.506	0.16388	0.01443	0.18295	0.00283	68.0	0.30072	0.02648	0.00790	0.00089	25.429	0.828	110.2	3.5
400	0.0387	35.958	0.188	0.08047	0.00590	0.03776	0.00131	31.0	0.14766	0.01083	0.00143	0.00039	24.780	0.415	107.4	1.8
600	0.1120	28.270	0.096	0.03020	0.00289	0.00854	0.00065	8.9	0.05541	0.00531	0.00080	0.00015	25.720	0.213	111.4	0.9
800	0.2036	27.520	0.118	0.01778	0.00196	0.00528	0.00063	5.7	0.03263	0.00359	0.00062	0.00012	25.932	0.218	112.3	0.9
1000	0.2727	27.474	0.122	0.02099	0.00290	0.00542	0.00055	5.8	0.03851	0.00532	0.00040	0.00023	25.845	0.201	111.9	0.8

1250	0.3475	27.781	0.110	0.02008	0.00321	0.00504	0.00080	5.4	0.03684	0.00588	0.00062	0.00014	26.264	0.259	113.7	1.1
1500	0.4130	27.439	0.078	0.01707	0.00308	0.00254	0.00091	2.7	0.03133	0.00565	0.00060	0.00019	26.662	0.278	115.3	1.2
1750	0.4714	27.348	0.154	0.02386	0.00394	0.00444	0.00093	4.8	0.04379	0.00722	0.00018	0.00025	26.009	0.312	112.6	1.3
2000	0.5230	27.252	0.079	0.03426	0.00537	0.00504	0.00126	5.5	0.06286	0.00985	0.00040	0.00028	25.737	0.381	111.5	1.6
2500	0.6064	27.082	0.080	0.04144	0.00349	0.00315	0.00081	3.4	0.07604	0.00641	0.00046	0.00014	26.126	0.254	113.1	1.1
3000	0.6833	27.039	0.079	0.05079	0.00320	0.00279	0.00050	3.0	0.09319	0.00587	0.00006	0.00014	26.190	0.167	113.4	0.7
4000	0.7670	27.203	0.118	0.06746	0.00307	0.00374	0.00055	4.1	0.12379	0.00564	0.00055	0.00015	26.075	0.198	112.9	0.8
5000	0.8697	27.042	0.103	0.03400	0.00344	0.00487	0.00064	5.3	0.06239	0.00632	0.00045	0.00015	25.576	0.213	110.8	0.9
8000	1.0000	27.651	0.098	0.05185	0.00239	0.00462	0.00042	4.9	0.09514	0.00438	0.00046	0.00009	26.263	0.157	113.7	0.7
Integrated		28.298	0.031	0.03848	0.00091	0.00771	0.00020	8.0	0.07061	0.00168	0.00059	0.00005	25.996	0.065	112.5	0.4

UAF114-31 03SH217 WM#2 04-01A05 USGSGOLD

Weighted average of J from standards = 0.002476 +/- 0.000006

Laser (mW)	Cum. ³⁹ Ar	⁴⁰ Ar/ ³⁹ Ar measured	+/-	³⁷ Ar/ ³⁹ Ar measured	+/-	³⁶ Ar/ ³⁹ Ar measured	+/-	% Atm. ⁴⁰ Ar	Ca/K	+/-	Cl/K	+/-	⁴⁰ Ar*/ ³⁹ Ar _K	+/-	Age (Ma)	+/- (Ma)
200	0.0086	73.936	0.609	0.11912	0.03412	0.16090	0.00670	64.3	0.21859	0.06262	0.00909	0.00124	26.371	1.962	114.1	8.2
400	0.0302	50.108	0.211	0.09322	0.00928	0.08274	0.00173	48.8	0.17106	0.01702	0.00346	0.00070	25.640	0.524	111.1	2.2
600	0.0966	31.285	0.101	0.02544	0.00293	0.02073	0.00085	19.6	0.04669	0.00538	0.00094	0.00017	25.132	0.265	108.9	1.1
800	0.1885	27.870	0.079	0.01188	0.00312	0.00608	0.00054	6.4	0.02179	0.00572	0.00064	0.00017	26.046	0.178	112.8	0.8
1000	0.2727	27.262	0.111	0.00902	0.00283	0.00451	0.00079	4.9	0.01655	0.00519	0.00047	0.00013	25.902	0.256	112.2	1.1
1250	0.3482	27.257	0.088	0.01057	0.00393	0.00486	0.00071	5.3	0.01940	0.00722	0.00024	0.00015	25.793	0.227	111.7	1.0
1500	0.4243	27.194	0.112	0.01506	0.00312	0.00476	0.00094	5.2	0.02763	0.00572	0.00066	0.00013	25.760	0.298	111.6	1.3
1750	0.4982	27.203	0.104	0.02539	0.00380	0.00392	0.00068	4.3	0.04658	0.00698	0.00051	0.00018	26.018	0.224	112.6	0.9
2000	0.5552	27.143	0.095	0.04579	0.00516	0.00381	0.00088	4.1	0.08403	0.00947	0.00045	0.00025	25.992	0.276	112.5	1.2
2500	0.6346	27.310	0.087	0.04402	0.00391	0.00391	0.00075	4.2	0.08077	0.00717	0.00013	0.00017	26.131	0.237	113.1	1.0
3000	0.7216	27.374	0.096	0.01323	0.00290	0.00294	0.00094	3.2	0.02428	0.00533	0.00031	0.00018	26.477	0.293	114.6	1.2
4000	0.8146	27.447	0.073	0.02306	0.00387	0.00345	0.00088	3.7	0.04232	0.00711	0.00039	0.00017	26.400	0.269	114.2	1.1
5000	0.8779	27.369	0.121	0.03967	0.00440	0.00459	0.00120	4.9	0.07278	0.00807	0.00057	0.00023	25.988	0.373	112.5	1.6
8000	1.0000	27.663	0.093	0.04432	0.00240	0.00413	0.00064	4.4	0.08133	0.00440	0.00036	0.00014	26.418	0.209	114.3	0.9
Integrated		28.550	0.028	0.02772	0.00103	0.00840	0.00024	8.7	0.05087	0.00189	0.00060	0.00005	26.040	0.075	112.7	0.4

UAF114-31 03SH217 WM#3 04-01B05 USGSGOLD

Weighted average of J from standards = 0.002476 +/- 0.000006

Laser (mW)	Cum. ³⁹ Ar	⁴⁰ Ar/ ³⁹ Ar measured	+/-	³⁷ Ar/ ³⁹ Ar measured	+/-	³⁶ Ar/ ³⁹ Ar measured	+/-	% Atm. ⁴⁰ Ar	Ca/K	+/-	Cl/K	+/-	⁴⁰ Ar*/ ³⁹ Ar _K	+/-	Age (Ma)	+/- (Ma)
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200	0.0072	94.970	0.880	0.18281	0.02615	0.24336	0.00488	75.7	0.33548	0.04800	0.00962	0.00123	23.046	1.323	100.1	5.6
400	0.0238	49.603	0.275	0.13531	0.01082	0.08508	0.00220	50.7	0.24829	0.01986	0.00219	0.00051	24.444	0.658	106.0	2.8
600	0.0779	29.313	0.090	0.04300	0.00254	0.01530	0.00063	15.4	0.07891	0.00467	0.00091	0.00020	24.768	0.203	107.4	0.9
800	0.1593	27.535	0.082	0.02278	0.00229	0.00686	0.00042	7.4	0.04180	0.00420	0.00060	0.00014	25.482	0.147	110.4	0.6
1000	0.2730	27.285	0.111	0.01226	0.00190	0.00493	0.00035	5.3	0.02249	0.00348	0.00038	0.00010	25.801	0.149	111.7	0.6
1250	0.4004	27.530	0.105	0.00738	0.00151	0.00323	0.00030	3.5	0.01354	0.00278	0.00029	0.00008	26.547	0.136	114.9	0.6
1500	0.4991	27.061	0.091	0.00950	0.00189	0.00305	0.00038	3.3	0.01743	0.00347	0.00042	0.00010	26.130	0.143	113.1	0.6
1750	0.5866	27.131	0.105	0.00479	0.00216	0.00217	0.00041	2.4	0.00879	0.00397	0.00029	0.00009	26.461	0.159	114.5	0.7
2000	0.6487	27.057	0.109	0.01039	0.00296	0.00302	0.00059	3.3	0.01906	0.00543	0.00041	0.00014	26.138	0.204	113.1	0.9
2500	0.7235	27.304	0.097	0.01257	0.00241	0.00297	0.00059	3.2	0.02307	0.00442	0.00035	0.00010	26.399	0.199	114.2	0.8
3000	0.7959	27.138	0.085	0.02011	0.00258	0.00269	0.00049	2.9	0.03690	0.00473	0.00056	0.00011	26.316	0.167	113.9	0.7
4000	0.8848	27.343	0.100	0.04575	0.00261	0.00279	0.00045	3.0	0.08395	0.00479	0.00030	0.00014	26.494	0.165	114.6	0.7
5000	0.9443	28.015	0.103	0.09851	0.00290	0.00433	0.00102	4.5	0.18077	0.00532	0.00073	0.00012	26.715	0.318	115.6	1.3
8000	1.0000	30.146	0.112	0.32456	0.00281	0.00932	0.00076	9.1	0.59566	0.00516	0.00054	0.00016	27.394	0.247	118.4	1.0
Integrated		28.454	0.030	0.04248	0.00069	0.00765	0.00015	7.9	0.07794	0.00127	0.00054	0.00004	26.170	0.052	113.3	0.4

UAF116-54 10650A WM#1 USGSGOLD

Weighted average of J from standards = 0.002450 +/- 0.000006

Laser (mW)	Cum. ³⁹ Ar	⁴⁰ Ar/ ³⁹ Ar measured	+/-	³⁷ Ar/ ³⁹ Ar measured	+/-	³⁶ Ar/ ³⁹ Ar measured	+/-	% Atm. ⁴⁰ Ar	Ca/K	+/-	Cl/K	+/-	⁴⁰ Ar*/ ³⁹ Ar _K	+/-	Age (Ma)	+/- (Ma)
300	0.0215	28.985	0.423	-0.02390	0.08374	0.03864	0.00145	39.4	-0.04386	0.15365	0.00379	0.00031	17.536	0.537	75.9	2.3
600	0.0741	31.536	0.110	-0.03008	0.03313	0.00789	0.00042	7.4	-0.05519	0.06079	0.00058	0.00016	29.172	0.160	124.5	0.7
900	0.1560	31.717	0.084	-0.04096	0.01854	0.00472	0.00029	4.4	-0.07516	0.03401	0.00031	0.00010	30.291	0.118	129.1	0.5
1200	0.2449	30.585	0.071	-0.06997	0.01904	0.00201	0.00033	2.0	-0.12839	0.03493	0.00020	0.00008	29.957	0.121	127.8	0.5
1500	0.3405	30.610	0.045	-0.06283	0.02795	0.00168	0.00041	1.6	-0.11529	0.05129	0.00017	0.00011	30.078	0.130	128.3	0.5
1800	0.4928	29.831	0.121	-0.07501	0.01376	0.00108	0.00028	1.1	-0.13762	0.02525	0.00016	0.00004	29.476	0.146	125.8	0.6
2100	0.5728	29.880	0.100	-0.05122	0.01591	0.00157	0.00022	1.6	-0.09397	0.02919	0.00040	0.00007	29.384	0.119	125.4	0.5
2500	0.6972	30.094	0.078	-0.06911	0.01686	0.00119	0.00019	1.2	-0.12680	0.03094	0.00027	0.00007	29.706	0.095	126.7	0.4
3000	0.7674	30.143	0.060	-0.06485	0.02367	0.00190	0.00032	1.9	-0.11899	0.04343	0.00054	0.00008	29.547	0.112	126.1	0.5
4000	0.8409	30.204	0.072	-0.03586	0.02949	0.00305	0.00025	3.0	-0.06579	0.05410	0.00189	0.00007	29.270	0.102	124.9	0.4
8000	1.0000	41.715	0.102	-0.08533	0.01091	0.01343	0.00018	9.5	-0.15656	0.02001	0.00878	0.00007	37.709	0.109	159.4	0.4
Integrated		32.175	0.032	-0.06256	0.00628	0.00490	0.00009	4.5	-0.11479	0.01153	0.00184	0.00003	30.691	0.042	130.8	0.4

UAF116-55 10650B WM#1 USGSGOLD

Weighted average of J from standards = 0.002450 +/- 0.000006

Laser (mW)	Cum. ³⁹ Ar	⁴⁰ Ar/ ³⁹ Ar measured	+/-	³⁷ Ar/ ³⁹ Ar measured	+/-	³⁶ Ar/ ³⁹ Ar measured	+/-	% Atm. ⁴⁰ Ar	Ca/K	+/-	Cl/K	+/-	⁴⁰ Ar*/ ³⁹ Ar _K	+/-	Age (Ma)	+/- (Ma)
300	0.0075	30.247	0.574	0.22963	0.11748	0.06764	0.00294	66.1	0.42141	0.21563	0.04505	0.00129	10.251	0.922	44.7	4.0
600	0.0224	32.720	0.241	0.06421	0.06447	0.02008	0.00109	18.1	0.11783	0.11831	0.00354	0.00020	26.762	0.388	114.6	1.6
900	0.0558	31.118	0.069	-0.02021	0.02607	0.00873	0.00052	8.3	-0.03708	0.04784	0.00067	0.00008	28.507	0.166	121.8	0.7
1200	0.1240	30.324	0.081	-0.03994	0.01449	0.00477	0.00029	4.7	-0.07328	0.02658	0.00025	0.00005	28.881	0.117	123.3	0.5
1500	0.1972	29.407	0.058	-0.02750	0.01507	0.00347	0.00037	3.5	-0.05046	0.02765	0.00023	0.00005	28.350	0.122	121.1	0.5
1800	0.2703	29.057	0.065	-0.04991	0.01323	0.00278	0.00024	2.8	-0.09158	0.02428	0.00012	0.00005	28.201	0.094	120.5	0.4
2100	0.3644	29.047	0.225	-0.04418	0.01345	0.00203	0.00021	2.1	-0.08106	0.02467	0.00025	0.00007	28.415	0.231	121.4	1.0
2400	0.4283	29.374	0.043	-0.03169	0.01883	0.00319	0.00025	3.2	-0.05814	0.03456	0.00027	0.00006	28.399	0.085	121.3	0.4
2700	0.4727	29.477	0.061	-0.01482	0.02203	0.00342	0.00034	3.4	-0.02720	0.04041	0.00031	0.00007	28.435	0.116	121.5	0.5
3200	0.5314	29.483	0.056	-0.01214	0.01915	0.00293	0.00028	2.9	-0.02228	0.03514	0.00021	0.00006	28.587	0.100	122.1	0.4
4000	0.6519	29.261	0.056	-0.04871	0.01006	0.00136	0.00015	1.4	-0.08937	0.01845	0.00019	0.00005	28.825	0.071	123.1	0.3
5000	0.7988	28.852	0.197	-0.04934	0.00847	0.00111	0.00013	1.1	-0.09053	0.01554	0.00019	0.00003	28.491	0.200	121.7	0.8
8000	1.0000	38.220	0.151	0.05155	0.01483	0.02229	0.00033	17.2	0.09460	0.02722	0.00061	0.00008	31.609	0.167	134.5	0.7
Integrated		31.202	0.048	-0.01668	0.00477	0.00741	0.00009	7.0	-0.03061	0.00876	0.00070	0.00002	28.982	0.054	123.7	0.4

UAF116-56 11059 WM#1 USGSGOLD

Weighted average of J from standards = 0.002450 +/- 0.000006

Laser (mW)	Cum. ³⁹ Ar	⁴⁰ Ar/ ³⁹ Ar measured	+/-	³⁷ Ar/ ³⁹ Ar measured	+/-	³⁶ Ar/ ³⁹ Ar measured	+/-	% Atm. ⁴⁰ Ar	Ca/K	+/-	Cl/K	+/-	⁴⁰ Ar*/ ³⁹ Ar _K	+/-	Age (Ma)	+/- (Ma)
300	0.0027	146.120	7.826	3.52384	1.01066	0.20268	0.02293	40.8	6.48063	1.86295	0.01534	0.00352	86.661	8.141	347.3	29.7
600	0.0118	53.826	0.622	5.05478	0.24455	0.05363	0.00725	28.8	9.30545	0.45168	0.00228	0.00111	38.457	2.189	162.4	8.8
900	0.0211	48.480	0.412	8.05057	0.29782	0.05731	0.00422	33.7	14.84952	0.55224	0.00222	0.00110	32.291	1.279	137.3	5.2
1200	0.0404	40.237	0.261	3.23557	0.13069	0.02727	0.00199	19.4	5.94936	0.24081	0.00129	0.00078	32.462	0.627	138.0	2.6
1800	0.1130	32.205	0.102	1.26603	0.04174	0.01517	0.00064	13.6	2.32491	0.07671	0.00038	0.00016	27.812	0.211	118.9	0.9
2500	0.2346	30.025	0.149	0.89106	0.04343	0.00962	0.00066	9.3	1.63592	0.07978	0.00049	0.00017	27.237	0.240	116.5	1.0
3500	0.3463	31.829	0.123	1.07788	0.03813	0.01385	0.00049	12.6	1.97915	0.07006	0.00046	0.00014	27.807	0.181	118.9	0.8
4500	0.4381	30.852	0.086	0.64989	0.04433	0.01035	0.00056	9.8	1.19296	0.08141	0.00043	0.00013	27.826	0.184	119.0	0.8
8000	1.0000	30.523	0.075	0.14295	0.01208	0.00654	0.00015	6.3	0.26231	0.02217	0.00024	0.00005	28.574	0.085	122.1	0.4
Integrated		31.641	0.052	0.65409	0.01199	0.01054	0.00018	9.7	1.20067	0.02201	0.00042	0.00005	28.558	0.072	122.0	0.4

Seward Peninsula

UAF116-44 04RN030A WM1 USGSGOLD

Weighted average of J from standards = 0.002450 +/- 0.000006

Laser (mW)	Cum. ³⁹ Ar	⁴⁰ Ar/ ³⁹ Ar measured	+/-	³⁷ Ar/ ³⁹ Ar measured	+/-	³⁶ Ar/ ³⁹ Ar measured	+/-	% Atm. ⁴⁰ Ar	Ca/K	+/-	Cl/K	+/-	⁴⁰ Ar*/ ³⁹ Ar _K	+/-	Age (Ma)	+/- (Ma)
300	0.0046	122.365	1.657	0.90059	0.33657	0.37926	0.01633	91.6	1.65343	0.61828	0.00669	0.00184	10.340	4.593	45.1	19.8
600	0.0623	56.632	0.132	2.93200	0.05270	0.06128	0.00111	31.6	5.39010	0.09707	0.00102	0.00027	38.790	0.340	163.8	1.4
900	0.1003	71.176	0.542	0.54386	0.04429	0.03782	0.00169	15.7	0.99826	0.08132	0.00049	0.00031	60.033	0.693	247.5	2.7
1200	0.2473	76.004	0.126	0.09978	0.01188	0.02268	0.00047	8.8	0.18310	0.02179	0.00062	0.00010	69.285	0.180	282.8	0.7
1400	0.3372	81.916	0.166	0.68695	0.02387	0.02305	0.00073	8.3	1.26102	0.04384	0.00052	0.00011	75.161	0.264	304.9	1.0
1600	0.4389	57.719	0.198	0.90411	0.02347	0.02347	0.00058	11.9	1.65989	0.04312	0.00060	0.00009	50.853	0.247	211.8	1.0
1900	0.5418	55.477	0.143	0.59239	0.01837	0.02114	0.00071	11.2	1.08737	0.03372	0.00054	0.00012	49.264	0.246	205.5	1.0
2200	0.7202	54.505	0.162	0.77932	0.01387	0.01580	0.00046	8.5	1.43068	0.02547	0.00087	0.00008	49.891	0.206	208.0	0.8
2500	0.7811	57.670	0.440	0.65306	0.02607	0.02395	0.00119	12.2	1.19879	0.04787	0.00057	0.00017	50.633	0.536	210.9	2.1
3000	0.8813	69.141	0.149	1.62722	0.02187	0.02009	0.00068	8.4	2.98890	0.04022	0.00096	0.00012	63.364	0.244	260.3	0.9
4000	0.9399	75.204	0.501	5.39171	0.05467	0.02169	0.00105	8.0	9.92790	0.10102	0.00144	0.00016	69.415	0.562	283.3	2.1
8000	1.0000	53.675	0.426	4.17174	0.05045	0.01937	0.00110	10.1	7.67542	0.09308	0.00424	0.00015	48.366	0.516	202.0	2.0
Integrated		64.450	0.072	1.33307	0.00769	0.02543	0.00024	11.5	2.44813	0.01413	0.00099	0.00004	57.057	0.096	236.0	0.7

UAF116-45 04RN030A GP#1 USGSGOLD

Weighted average of J from standards = 0.002450 +/- 0.000006

Laser (mW)	Cum. ³⁹ Ar	⁴⁰ Ar/ ³⁹ Ar measured	+/-	³⁷ Ar/ ³⁹ Ar measured	+/-	³⁶ Ar/ ³⁹ Ar measured	+/-	% Atm. ⁴⁰ Ar	Ca/K	+/-	Cl/K	+/-	⁴⁰ Ar*/ ³⁹ Ar _K	+/-	Age (Ma)	+/- (Ma)
300	0.0312	179.268	2.214	4.76272	0.39780	0.37649	0.01040	61.9	8.76612	0.73445	0.01804	0.00129	68.557	2.916	280.1	11.0
600	0.1605	84.023	0.339	12.63977	0.10452	0.13801	0.00266	47.4	23.38467	0.19497	0.00824	0.00036	44.528	0.810	186.8	3.2
900	0.1921	95.599	1.541	5.24085	0.41104	0.13656	0.00893	41.8	9.64916	0.75937	0.01648	0.00111	55.802	2.813	231.1	10.9
1200	0.4460	77.837	0.470	7.33443	0.08266	0.05669	0.00112	20.8	13.52224	0.15314	0.02406	0.00028	61.903	0.502	254.7	1.9
1500	0.5171	99.053	1.850	10.86719	0.28197	0.06788	0.00662	19.4	20.08186	0.52478	0.03568	0.00109	80.350	2.591	324.1	9.6
1800	0.6098	104.212	2.119	18.30722	0.40701	0.06534	0.00321	17.2	33.99640	0.76494	0.04485	0.00139	87.292	2.132	349.6	7.8
2100	0.7134	97.066	1.636	14.50510	0.26948	0.05755	0.00264	16.4	26.86857	0.50393	0.04016	0.00104	81.893	1.717	329.8	6.3
2400	0.9142	113.529	0.585	13.61398	0.11254	0.05606	0.00124	13.7	25.20314	0.21020	0.04695	0.00047	98.832	0.641	391.1	2.3
2800	0.9384	135.879	1.566	22.08314	0.54750	0.06625	0.00992	13.2	41.11053	1.03410	0.05897	0.00177	119.650	3.281	463.7	11.2
3200	0.9505	131.437	3.931	20.52756	1.09886	0.07562	0.02053	15.8	38.17541	2.07125	0.05720	0.00406	112.100	7.003	437.7	24.3
4000	0.9684	127.281	1.936	21.73903	0.57826	0.06966	0.00843	14.9	40.46072	1.09171	0.05951	0.00333	109.856	3.032	429.9	10.6
5000	0.9785	157.166	2.787	24.29480	1.04435	0.09896	0.01251	17.4	45.29398	1.97832	0.07272	0.00275	131.804	4.435	504.8	14.8
8000	1.0000	227.476	2.068	47.88372	0.78897	0.12674	0.00635	14.9	90.68695	1.54230	0.11523	0.00269	199.819	2.686	718.8	8.0
Integrated		102.524	0.364	12.99582	0.06820	0.08387	0.00100	23.2	24.04901	0.12728	0.03494	0.00025	79.359	0.428	320.5	1.8

UAF116-39 04MBW332A BI#1 USGSGOLD

Weighted average of J from standards = 0.002450 +/- 0.000006

Laser (mW)	Cum. ³⁹ Ar	⁴⁰ Ar/ ³⁹ Ar measured	+/-	³⁷ Ar/ ³⁹ Ar measured	+/-	³⁶ Ar/ ³⁹ Ar measured	+/-	% Atm. ⁴⁰ Ar	Ca/K	+/-	Cl/K	+/-	⁴⁰ Ar*/ ³⁹ Ar _K	+/-	Age (Ma)	+/- (Ma)
500	0.0006	61.827	1.506	1.02388	1.27172	0.17568	0.01145	83.9	1.87993	2.33654	-0.00363	0.01022	9.970	3.235	43.5	14.0
600	0.0034	65.186	3.405	0.50163	0.34100	0.13266	0.00837	60.1	0.92073	0.62610	0.00491	0.00230	26.003	3.370	111.4	14.0
900	0.0053	54.760	0.786	0.14431	0.41267	0.06876	0.00457	37.1	0.26481	0.75734	0.00218	0.00315	34.427	1.488	146.1	6.1
1200	0.0110	54.797	1.418	0.11563	0.13132	0.04713	0.00184	25.4	0.21219	0.24100	0.00499	0.00110	40.853	1.348	172.1	5.4
1500	0.0126	54.869	0.677	0.36446	0.52952	0.03079	0.00558	16.5	0.66890	0.97207	-0.00042	0.00426	45.781	1.743	191.8	6.9
1600	0.1759	51.208	0.420	0.04976	0.01785	0.03019	0.00047	17.4	0.09130	0.03275	0.00489	0.00013	42.263	0.402	177.7	1.6
1800	0.3592	45.769	0.108	-0.00391	0.00594	0.00900	0.00021	5.8	-0.00718	0.01090	0.00323	0.00007	43.080	0.121	181.0	0.5
2000	0.5072	47.964	0.114	0.06631	0.01452	0.01140	0.00015	7.0	0.12167	0.02664	0.00456	0.00011	44.573	0.117	186.9	0.5
2200	0.6058	48.129	0.103	-0.03887	0.01070	0.00886	0.00015	5.4	-0.07131	0.01963	0.00383	0.00007	45.479	0.109	190.6	0.4
2400	0.7112	47.610	0.105	-0.04385	0.01061	0.00879	0.00015	5.5	-0.08046	0.01947	0.00364	0.00008	44.979	0.112	188.6	0.4
2600	0.8038	46.654	0.096	-0.03259	0.01054	0.00835	0.00014	5.3	-0.05980	0.01933	0.00319	0.00009	44.156	0.101	185.3	0.4
2800	0.8823	46.200	0.117	-0.02683	0.01104	0.00724	0.00017	4.6	-0.04923	0.02025	0.00315	0.00010	44.028	0.125	184.8	0.5
3000	0.9379	46.410	0.066	0.04002	0.01853	0.00767	0.00028	4.9	0.07344	0.03400	0.00361	0.00014	44.118	0.105	185.1	0.4
3200	0.9631	48.553	0.200	0.04717	0.03171	0.00726	0.00029	4.4	0.08654	0.05819	0.00219	0.00027	46.385	0.213	194.2	0.8
4000	0.9929	48.741	0.130	0.04143	0.02589	0.00757	0.00043	4.6	0.07603	0.04751	0.00240	0.00023	46.480	0.179	194.5	0.7
9000	1.0000	60.456	0.250	0.34175	0.12381	0.01715	0.00150	8.3	0.62720	0.22728	0.00170	0.00088	55.398	0.499	229.6	1.9
Integrated		47.971	0.075	0.01426	0.00498	0.01329	0.00010	8.2	0.02616	0.00914	0.00375	0.00004	44.015	0.077	184.7	0.5

UAF116-46 04RN128A GP#1 USGSGOLD

Weighted average of J from standards = 0.002450 +/- 0.000006

Laser (mW)	Cum. ³⁹ Ar	⁴⁰ Ar/ ³⁹ Ar measured	+/-	³⁷ Ar/ ³⁹ Ar measured	+/-	³⁶ Ar/ ³⁹ Ar measured	+/-	% Atm. ⁴⁰ Ar	Ca/K	+/-	Cl/K	+/-	⁴⁰ Ar*/ ³⁹ Ar _K	+/-	Age (Ma)	+/- (Ma)
300	0.0501	127.013	2.358	0.91727	0.15092	0.24908	0.00567	57.9	1.68407	0.27725	0.04700	0.00127	53.483	2.404	222.1	9.4
600	0.0952	88.674	2.072	1.58280	0.20115	0.18226	0.00698	60.6	2.90721	0.36984	0.01847	0.00087	34.942	2.390	148.2	9.7
900	0.1425	60.961	1.227	1.69139	0.22408	0.15020	0.00683	72.6	3.10688	0.41206	0.00987	0.00072	16.694	2.113	72.3	9.0
1100	0.1808	65.285	0.826	2.08028	0.31792	0.14400	0.00451	65.0	3.82220	0.58492	0.00886	0.00104	22.891	1.342	98.4	5.6
1300	0.2373	60.314	0.396	2.09802	0.18549	0.12039	0.00431	58.8	3.85485	0.34129	0.01000	0.00052	24.900	1.274	106.8	5.3
1500	0.2685	62.057	0.936	3.34756	0.25894	0.12274	0.00571	58.1	6.15574	0.47720	0.00807	0.00103	26.066	1.711	111.7	7.1
1700	0.3261	56.974	0.969	4.09692	0.24846	0.08732	0.00356	44.8	7.53739	0.45833	0.00791	0.00059	31.534	1.229	134.2	5.0
1900	0.4269	56.813	1.083	4.78723	0.16991	0.07166	0.00275	36.7	8.81136	0.31372	0.00736	0.00047	36.080	1.155	152.8	4.7
2200	0.5975	55.549	1.009	16.92506	0.36935	0.05514	0.00196	27.1	31.40114	0.69289	0.00664	0.00040	40.949	1.035	172.5	4.2

2500	0.7545	52.676	1.203	16.22481	0.42079	0.05591	0.00214	29.1	30.08810	0.78866	0.00619	0.00038	37.743	1.200	159.5	4.9
2900	0.9398	51.676	1.065	18.38498	0.43350	0.05263	0.00226	27.4	34.14255	0.81479	0.00574	0.00035	37.928	1.127	160.3	4.6
3500	0.9677	65.191	1.293	13.84043	0.41945	0.12226	0.00701	53.8	25.62618	0.78369	0.00279	0.00123	30.348	2.196	129.4	9.0
4000	0.9732	127.519	3.550	26.74739	2.84305	0.41413	0.04234	94.4	49.94749	5.40313	0.00305	0.00649	7.249	12.290	31.8	53.4
8000	1.0000	60.570	0.531	49.24310	0.68045	0.10149	0.00742	43.4	93.34675	1.33260	0.00686	0.00119	35.384	2.273	150.0	9.2
Integrated		61.527	0.405	11.97239	0.11832	0.09240	0.00106	42.9	22.14025	0.22052	0.00945	0.00017	35.370	0.428	149.9	1.8

UAF116-42 04MBW540A WM#1 USGSGOLD

Weighted average of J from standards = 0.002450 +/- 0.000006

Laser (mW)	Cum. ³⁹ Ar	⁴⁰ Ar/ ³⁹ Ar measured	+/-	³⁷ Ar/ ³⁹ Ar measured	+/-	³⁶ Ar/ ³⁹ Ar measured	+/-	% Atm. ⁴⁰ Ar	Ca/K	+/-	Cl/K	+/-	⁴⁰ Ar*/ ³⁹ Ar _K	+/-	Age (Ma)	+/- (Ma)
300	0.0025	51.324	0.590	0.29426	0.38468	0.11110	0.00568	64.0	0.54002	0.70611	0.00500	0.00100	18.491	1.652	79.9	7.0
600	0.0095	37.622	0.501	0.11440	0.12672	0.02862	0.00178	22.5	0.20993	0.23256	0.00113	0.00041	29.146	0.686	124.4	2.8
900	0.1201	34.582	0.111	-0.04116	0.01087	0.00328	0.00021	2.8	-0.07553	0.01995	0.00037	0.00005	33.579	0.125	142.6	0.5
1400	0.2322	34.601	0.131	-0.05352	0.01051	0.00199	0.00021	1.7	-0.09819	0.01928	0.00022	0.00005	33.980	0.143	144.2	0.6
1600	0.3582	32.858	0.075	-0.04665	0.00817	0.00223	0.00016	2.0	-0.08560	0.01499	0.00024	0.00004	32.167	0.088	136.8	0.4
1800	0.4540	35.811	0.091	-0.04998	0.01039	0.00330	0.00021	2.7	-0.09171	0.01906	0.00023	0.00004	34.804	0.109	147.6	0.4
2000	0.5812	35.976	0.055	-0.05063	0.00768	0.00219	0.00016	1.8	-0.09290	0.01409	0.00025	0.00005	35.295	0.072	149.6	0.3
2200	0.7079	34.231	0.086	-0.05351	0.00811	0.00223	0.00011	1.9	-0.09819	0.01489	0.00022	0.00004	33.538	0.091	142.4	0.4
2400	0.7484	34.892	0.079	-0.04661	0.02152	0.00227	0.00027	1.9	-0.08552	0.03949	0.00021	0.00006	34.188	0.113	145.1	0.5
3000	0.8859	34.357	0.065	-0.04799	0.00802	0.00095	0.00014	0.8	-0.08805	0.01472	0.00026	0.00004	34.045	0.077	144.5	0.3
4000	0.9313	34.279	0.070	-0.03850	0.02180	0.00128	0.00028	1.1	-0.07063	0.04000	0.00017	0.00008	33.867	0.109	143.8	0.4
8000	1.0000	33.307	0.055	-0.03933	0.01316	0.00084	0.00024	0.8	-0.07217	0.02414	0.00015	0.00004	33.027	0.089	140.4	0.4
Integrated		34.561	0.029	-0.04584	0.00352	0.00256	0.00006	2.2	-0.08410	0.00646	0.00026	0.00002	33.771	0.034	143.4	0.4

UAF116-47 04RN318A AM#1 USGSGOLD

Weighted average of J from standards = 0.002450 +/- 0.000006

Laser (mW)	Cum. ³⁹ Ar	⁴⁰ Ar/ ³⁹ Ar measured	+/-	³⁷ Ar/ ³⁹ Ar measured	+/-	³⁶ Ar/ ³⁹ Ar measured	+/-	% Atm. ⁴⁰ Ar	Ca/K	+/-	Cl/K	+/-	⁴⁰ Ar*/ ³⁹ Ar _K	+/-	Age (Ma)	+/- (Ma)
300	0.0049	2385.179	77.873	1.24077	1.78372	7.21725	0.23592	89.4	2.27848	3.27818	0.04227	0.00496	252.750	31.665	869.4	86.4
600	0.0303	333.292	4.936	2.56681	0.22041	0.96702	0.01819	85.7	4.71762	0.40578	0.00470	0.00117	47.780	4.128	199.7	16.3
900	0.0727	147.280	1.483	4.15100	0.19246	0.41072	0.00617	82.2	7.63715	0.35505	0.00128	0.00067	26.266	1.812	112.5	7.5
1200	0.1222	122.606	0.941	9.85187	0.14655	0.31168	0.00538	74.5	18.19351	0.27237	0.00172	0.00055	31.417	1.546	133.8	6.3
1500	0.1991	50.267	0.319	17.34849	0.19540	0.06398	0.00255	35.0	32.19570	0.36678	0.00163	0.00031	33.009	0.785	140.3	3.2
1800	0.3360	40.015	0.103	18.76156	0.09321	0.02976	0.00153	18.5	34.85054	0.17529	0.00131	0.00016	33.004	0.466	140.3	1.9

2100	0.5063	42.809	0.219	18.56109	0.13743	0.03961	0.00153	24.1	34.47361	0.25838	0.00126	0.00013	32.867	0.497	139.7	2.0
2400	0.7208	38.988	0.360	18.73107	0.23336	0.02918	0.00111	18.5	34.79321	0.43882	0.00131	0.00021	32.135	0.460	136.7	1.9
2700	0.8723	37.989	0.381	18.13230	0.26864	0.02466	0.00159	15.6	33.66769	0.50476	0.00153	0.00028	32.418	0.589	137.9	2.4
3000	0.9220	36.289	0.288	14.46150	0.18694	0.02580	0.00397	18.0	26.78704	0.34956	0.00148	0.00040	30.004	1.208	128.0	5.0
4000	0.9420	40.664	0.302	12.27248	0.35476	0.03320	0.00990	21.9	22.69966	0.66147	0.00296	0.00113	32.001	2.959	136.2	12.1
8000	1.0000	35.725	0.184	15.51405	0.24016	0.02048	0.00358	13.7	28.75658	0.44970	0.00160	0.00050	31.125	1.081	132.6	4.4
Integrated		67.655	0.212	16.43982	0.07364	0.12083	0.00088	51.0	30.49114	0.13805	0.00172	0.00010	33.514	0.299	142.3	1.3

UAF116-48 04RN318B WM#1 USGSGOLD

Weighted average of J from standards = 0.002450 +/- 0.000006

Laser (mW)	Cum. ³⁹ Ar	⁴⁰ Ar/ ³⁹ Ar measured	+/-	³⁷ Ar/ ³⁹ Ar measured	+/-	³⁶ Ar/ ³⁹ Ar measured	+/-	% Atm. ⁴⁰ Ar	Ca/K	+/-	Cl/K	+/-	⁴⁰ Ar*/ ³⁹ Ar _K	+/-	Age (Ma)	+/- (Ma)
300	0.0028	114.977	3.163	0.98839	0.19171	0.32685	0.01040	84.0	1.81473	0.35222	0.00083	0.00171	18.451	3.452	79.8	14.6
600	0.0179	45.971	0.944	0.06248	0.04915	0.05346	0.00129	34.4	0.11464	0.09020	0.00047	0.00024	30.152	0.833	128.6	3.4
900	0.0900	32.588	0.154	-0.02570	0.01414	0.01217	0.00032	11.1	-0.04716	0.02594	0.00031	0.00005	28.961	0.173	123.7	0.7
1100	0.3319	30.131	0.057	-0.05300	0.00410	0.00273	0.00008	2.7	-0.09724	0.00753	0.00010	0.00002	29.290	0.061	125.0	0.3
1300	0.5022	31.072	0.099	-0.03264	0.00544	0.00263	0.00010	2.5	-0.05989	0.00999	0.00017	0.00003	30.265	0.102	129.0	0.4
1500	0.6793	32.385	0.056	-0.03928	0.00891	0.00233	0.00013	2.1	-0.07207	0.01636	0.00013	0.00004	31.664	0.066	134.8	0.3
1700	0.7375	31.249	0.063	0.06678	0.01453	0.00449	0.00035	4.2	0.12253	0.02667	0.00025	0.00008	29.900	0.120	127.5	0.5
2000	0.7978	30.140	0.065	0.03528	0.01383	0.00372	0.00031	3.6	0.06474	0.02538	0.00030	0.00006	29.016	0.112	123.9	0.5
2300	0.8392	29.219	0.105	0.16377	0.02202	0.00483	0.00035	4.8	0.30053	0.04042	0.00033	0.00012	27.779	0.143	118.8	0.6
2700	0.8490	30.940	0.121	0.41105	0.11054	0.01579	0.00208	15.0	0.75443	0.20294	0.00066	0.00045	26.283	0.624	112.6	2.6
3500	0.8756	29.003	0.070	0.12840	0.03182	0.00498	0.00075	5.0	0.23562	0.05840	0.00025	0.00014	27.516	0.231	117.7	1.0
8000	1.0000	31.077	0.054	0.00285	0.01028	0.00235	0.00018	2.2	0.00522	0.01887	0.00021	0.00003	30.353	0.075	129.4	0.3
Integrated		31.469	0.031	-0.00284	0.00346	0.00539	0.00007	5.1	-0.00520	0.00636	0.00019	0.00002	29.847	0.037	127.3	0.4

UAF114-32 04Z288A WM#1 03-31C05 USGSGOLD

Weighted average of J from standards = 0.002476 +/- 0.000006

Laser (mW)	Cum. ³⁹ Ar	⁴⁰ Ar/ ³⁹ Ar measured	+/-	³⁷ Ar/ ³⁹ Ar measured	+/-	³⁶ Ar/ ³⁹ Ar measured	+/-	% Atm. ⁴⁰ Ar	Ca/K	+/-	Cl/K	+/-	⁴⁰ Ar*/ ³⁹ Ar _K	+/-	Age (Ma)	+/- (Ma)
200	0.0036	150.396	0.830	0.03156	0.01384	0.44585	0.00431	87.6	0.05790	0.02539	0.00373	0.00067	18.620	1.170	81.3	5.0
400	0.0124	65.302	0.319	0.11138	0.00581	0.13427	0.00143	60.8	0.20438	0.01066	0.00147	0.00029	25.608	0.438	110.9	1.8
600	0.0272	45.500	0.135	0.02934	0.00275	0.06363	0.00081	41.3	0.05384	0.00505	0.00049	0.00020	26.673	0.267	115.4	1.1
800	0.0525	34.727	0.116	0.02278	0.00208	0.02479	0.00041	21.1	0.04181	0.00382	0.00069	0.00010	27.376	0.161	118.3	0.7
1000	0.0996	37.946	0.122	0.01097	0.00120	0.02672	0.00030	20.8	0.02013	0.00219	0.00041	0.00006	30.022	0.140	129.4	0.6

1250	0.1646	32.457	0.101	0.00052	0.00070	0.00373	0.00017	3.4	0.00095	0.00129	0.00033	0.00003	31.327	0.112	134.8	0.5
1500	0.2232	33.263	0.134	0.00583	0.00068	0.00548	0.00022	4.9	0.01069	0.00125	0.00040	0.00004	31.615	0.145	136.0	0.6
1750	0.2746	32.451	0.110	0.01115	0.00108	0.00545	0.00020	5.0	0.02045	0.00198	0.00040	0.00005	30.812	0.123	132.7	0.5
2000	0.3189	31.706	0.121	0.00745	0.00078	0.00498	0.00027	4.6	0.01366	0.00142	0.00033	0.00005	30.207	0.142	130.1	0.6
2500	0.3790	31.414	0.121	0.00170	0.00062	0.00362	0.00019	3.4	0.00313	0.00114	0.00040	0.00003	30.316	0.131	130.6	0.5
3000	0.4407	31.333	0.100	0.00050	0.00062	0.00239	0.00020	2.3	0.00092	0.00113	0.00034	0.00004	30.597	0.115	131.8	0.5
4000	0.5326	32.261	0.108	-0.00064	0.00036	0.00176	0.00009	1.6	-0.00117	0.00067	0.00034	0.00003	31.713	0.110	136.4	0.5
5000	0.7172	32.208	0.198	0.00130	0.00020	0.00185	0.00005	1.7	0.00238	0.00036	0.00039	0.00003	31.634	0.198	136.1	0.8
8000	1.0000	31.731	0.198	0.00115	0.00017	0.00181	0.00004	1.7	0.00212	0.00031	0.00037	0.00002	31.167	0.198	134.1	0.8
Integrated		33.292	0.071	0.00453	0.00017	0.00806	0.00004	7.2	0.00832	0.00031	0.00040	0.00001	30.883	0.070	132.9	0.4

UAF114-32 04Z288A WM#2 04-02B05 USGSGOLD

Weighted average of J from standards = 0.002476 +/- 0.000006

Laser (mW)	Cum. ³⁹ Ar	⁴⁰ Ar/ ³⁹ Ar measured	+/-	³⁷ Ar/ ³⁹ Ar measured	+/-	³⁶ Ar/ ³⁹ Ar measured	+/-	% Atm. ⁴⁰ Ar	Ca/K	+/-	Cl/K	+/-	⁴⁰ Ar*/ ³⁹ Ar _K	+/-	Age (Ma)	+/- (Ma)
200	0.0037	59.932	0.290	0.03906	0.01801	0.14126	0.00461	69.7	0.07166	0.03304	0.00416	0.00090	18.165	1.362	79.4	5.8
400	0.0207	35.285	0.132	0.12736	0.00467	0.03310	0.00102	27.7	0.23371	0.00856	0.00094	0.00022	25.487	0.320	110.4	1.3
600	0.0577	29.980	0.100	0.01332	0.00253	0.00867	0.00032	8.5	0.02444	0.00465	0.00039	0.00010	27.391	0.133	118.4	0.6
800	0.1323	31.482	0.132	-0.00130	0.00128	0.00415	0.00020	3.9	-0.00239	0.00234	0.00031	0.00005	30.227	0.142	130.2	0.6
1000	0.2287	30.787	0.103	-0.00040	0.00116	0.00254	0.00017	2.4	-0.00072	0.00213	0.00035	0.00005	30.008	0.113	129.3	0.5
1250	0.3271	30.859	0.097	0.00075	0.00080	0.00227	0.00027	2.2	0.00138	0.00148	0.00031	0.00005	30.160	0.124	129.9	0.5
1500	0.4240	31.229	0.106	-0.00282	0.00076	0.00186	0.00022	1.8	-0.00518	0.00139	0.00032	0.00004	30.651	0.123	132.0	0.5
1750	0.5141	31.448	0.108	-0.00249	0.00134	0.00150	0.00029	1.4	-0.00456	0.00246	0.00028	0.00005	30.975	0.138	133.3	0.6
2000	0.6083	31.733	0.103	0.00099	0.00075	0.00121	0.00026	1.1	0.00181	0.00137	0.00031	0.00004	31.347	0.128	134.9	0.5
2500	0.7249	30.652	0.099	-0.00245	0.00078	0.00113	0.00022	1.1	-0.00450	0.00143	0.00036	0.00004	30.290	0.118	130.5	0.5
3000	0.8305	30.504	0.106	-0.00271	0.00081	0.00080	0.00021	0.8	-0.00496	0.00149	0.00025	0.00004	30.239	0.122	130.3	0.5
4000	0.9623	29.927	0.104	-0.00263	0.00087	0.00037	0.00024	0.4	-0.00482	0.00160	0.00026	0.00004	29.790	0.126	128.4	0.5
5000	0.9912	30.062	0.118	0.00886	0.00313	0.00181	0.00060	1.8	0.01626	0.00574	0.00046	0.00012	29.499	0.211	127.2	0.9
8000	1.0000	30.495	0.392	0.01597	0.00999	0.00757	0.00211	7.3	0.02931	0.01833	0.00029	0.00036	28.231	0.727	121.9	3.0
Integrated		31.010	0.033	0.00181	0.00034	0.00300	0.00008	2.9	0.00332	0.00063	0.00034	0.00002	30.095	0.040	129.7	0.4

UAF114-32 04Z288A WM#3 04-03A05 USGSGOLD

Weighted average of J from standards = 0.002476 +/- 0.000006

Laser (mW)	Cum. ³⁹ Ar	⁴⁰ Ar/ ³⁹ Ar measured	+/-	³⁷ Ar/ ³⁹ Ar measured	+/-	³⁶ Ar/ ³⁹ Ar measured	+/-	% Atm. ⁴⁰ Ar	Ca/K	+/-	Cl/K	+/-	⁴⁰ Ar*/ ³⁹ Ar _K	+/-	Age (Ma)	+/- (Ma)
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200	0.0032	60.089	0.466	0.02078	0.01963	0.13396	0.00465	65.9	0.03814	0.03602	0.00331	0.00082	20.477	1.358	89.2	5.8
400	0.0175	37.431	0.115	0.01367	0.00468	0.03970	0.00097	31.4	0.02508	0.00859	0.00062	0.00024	25.671	0.304	111.2	1.3
600	0.0501	30.478	0.101	0.00696	0.00263	0.00952	0.00050	9.2	0.01276	0.00482	0.00043	0.00011	27.636	0.176	119.4	0.7
800	0.1134	32.531	0.113	0.00111	0.00141	0.00460	0.00031	4.2	0.00204	0.00259	0.00031	0.00006	31.142	0.144	134.0	0.6
1000	0.1977	32.650	0.122	0.00138	0.00093	0.00250	0.00017	2.3	0.00253	0.00171	0.00038	0.00005	31.884	0.131	137.1	0.5
1250	0.2967	32.228	0.108	-0.00035	0.00102	0.00218	0.00012	2.0	-0.00063	0.00188	0.00026	0.00004	31.554	0.113	135.7	0.5
1500	0.3918	31.718	0.118	0.00056	0.00085	0.00217	0.00013	2.0	0.00103	0.00157	0.00031	0.00004	31.047	0.123	133.6	0.5
1750	0.4824	31.998	0.107	0.00429	0.00098	0.00173	0.00013	1.6	0.00787	0.00180	0.00031	0.00004	31.459	0.113	135.3	0.5
2000	0.5551	30.879	0.103	0.00250	0.00115	0.00182	0.00016	1.7	0.00459	0.00212	0.00031	0.00004	30.313	0.113	130.6	0.5
2500	0.6414	30.618	0.097	0.00310	0.00083	0.00188	0.00012	1.8	0.00569	0.00152	0.00031	0.00004	30.034	0.103	129.4	0.4
3000	0.7355	30.894	0.104	0.00102	0.00077	0.00137	0.00016	1.3	0.00187	0.00141	0.00025	0.00003	30.461	0.114	131.2	0.5
4000	0.8604	30.708	0.174	0.00219	0.00039	0.00150	0.00009	1.4	0.00402	0.00072	0.00039	0.00001	30.238	0.175	130.3	0.7
5000	0.9367	30.360	0.104	-0.00130	0.00072	0.00091	0.00011	0.9	-0.00239	0.00132	0.00029	0.00003	30.061	0.109	129.5	0.5
8000	1.0000	31.181	0.104	-0.00146	0.00083	0.00124	0.00014	1.2	-0.00268	0.00151	0.00024	0.00002	30.785	0.111	132.5	0.5
Integrated		31.558	0.036	0.00171	0.00028	0.00314	0.00005	2.9	0.00314	0.00052	0.00033	0.00001	30.601	0.039	131.8	0.4

UAF114-33 04Z296A WM#1 03-31D05 USGSGOLD

Weighted average of J from standards = 0.002476 +/- 0.000006

Laser (mW)	Cum. ³⁹ Ar	⁴⁰ Ar/ ³⁹ Ar measured	+/-	³⁷ Ar/ ³⁹ Ar measured	+/-	³⁶ Ar/ ³⁹ Ar measured	+/-	% Atm. ⁴⁰ Ar	Ca/K	+/-	Cl/K	+/-	⁴⁰ Ar*/ ³⁹ Ar _K	+/-	Age (Ma)	+/- (Ma)
200	0.0033	55.926	0.582	0.07082	0.03573	0.12647	0.00887	66.9	0.12994	0.06556	0.01114	0.00189	18.530	2.606	80.9	11.1
400	0.0178	35.123	0.174	0.03469	0.00791	0.03520	0.00190	29.6	0.06365	0.01452	0.00124	0.00035	24.696	0.576	107.1	2.4
600	0.0609	30.913	0.100	0.01539	0.00243	0.00848	0.00060	8.1	0.02824	0.00446	0.00040	0.00014	28.382	0.202	122.5	0.8
800	0.1448	30.947	0.099	-0.00052	0.00131	0.00297	0.00039	2.8	-0.00096	0.00241	0.00029	0.00008	30.039	0.150	129.4	0.6
1000	0.2421	30.711	0.094	-0.00048	0.00114	0.00268	0.00024	2.6	-0.00088	0.00210	0.00035	0.00006	29.889	0.117	128.8	0.5
1250	0.3297	31.945	0.107	-0.00061	0.00112	0.00270	0.00029	2.5	-0.00113	0.00205	0.00034	0.00005	31.119	0.136	133.9	0.6
1500	0.4304	32.300	0.107	-0.00174	0.00100	0.00200	0.00029	1.8	-0.00318	0.00183	0.00031	0.00007	31.680	0.137	136.2	0.6
1750	0.5289	30.943	0.091	-0.00102	0.00116	0.00134	0.00024	1.3	-0.00188	0.00212	0.00027	0.00004	30.517	0.115	131.4	0.5
2000	0.6212	28.875	0.098	-0.00019	0.00121	0.00158	0.00033	1.6	-0.00035	0.00222	0.00031	0.00005	28.380	0.137	122.5	0.6
2500	0.7245	29.664	0.083	0.00000	0.00101	0.00176	0.00025	1.8	0.00001	0.00185	0.00028	0.00004	29.114	0.110	125.6	0.5
3000	0.8257	29.484	0.091	0.00120	0.00124	0.00077	0.00027	0.8	0.00221	0.00227	0.00044	0.00005	29.229	0.121	126.1	0.5
4000	0.9369	30.131	0.096	-0.00047	0.00105	0.00060	0.00024	0.6	-0.00087	0.00193	0.00040	0.00003	29.925	0.119	129.0	0.5
5000	0.9764	29.056	0.123	-0.00039	0.00218	0.00119	0.00073	1.2	-0.00072	0.00399	0.00043	0.00011	28.676	0.247	123.8	1.0
8000	1.0000	29.449	0.253	0.00995	0.00406	0.00526	0.00116	5.3	0.01827	0.00744	0.00078	0.00018	27.866	0.422	120.4	1.8
Integrated		30.615	0.030	0.00125	0.00041	0.00301	0.00010	2.9	0.00229	0.00074	0.00040	0.00002	29.696	0.042	128.0	0.4

UAF114-33 04Z296A WM#2 04-03B05 USGSGOLD

Weighted average of J from standards = 0.002476 +/- 0.000006

Laser (mW)	Cum. ³⁹ Ar	⁴⁰ Ar/ ³⁹ Ar measured	+/-	³⁷ Ar/ ³⁹ Ar measured	+/-	³⁶ Ar/ ³⁹ Ar measured	+/-	% Atm. ⁴⁰ Ar	Ca/K	+/-	Cl/K	+/-	⁴⁰ Ar*/ ³⁹ Ar _K	+/-	Age (Ma)	+/- (Ma)
200	0.0042	51.377	0.400	-0.25561	0.01834	0.11598	0.00271	66.8	-0.46893	0.03364	0.00019	0.00063	17.055	0.787	74.6	3.4
400	0.0235	33.266	0.119	-0.00762	0.00463	0.02710	0.00051	24.1	-0.01398	0.00849	0.00018	0.00014	25.230	0.182	109.3	0.8
600	0.0785	29.075	0.082	0.00125	0.00127	0.00687	0.00024	7.0	0.00229	0.00233	0.00008	0.00007	27.017	0.107	116.8	0.5
800	0.1520	29.909	0.095	-0.01354	0.00113	0.00403	0.00017	4.0	-0.02484	0.00208	0.00012	0.00005	28.690	0.106	123.8	0.4
1000	0.2449	29.493	0.104	-0.00850	0.00102	0.00240	0.00018	2.4	-0.01560	0.00187	0.00008	0.00004	28.756	0.115	124.1	0.5
1250	0.3472	30.173	0.088	0.00140	0.00040	0.00160	0.00011	1.6	0.00256	0.00073	0.00036	0.00003	29.672	0.093	127.9	0.4
1500	0.4606	30.026	0.085	0.00054	0.00048	0.00125	0.00009	1.2	0.00099	0.00088	0.00039	0.00003	29.628	0.089	127.7	0.4
1750	0.5670	30.102	0.087	0.00177	0.00073	0.00100	0.00012	1.0	0.00325	0.00135	0.00037	0.00005	29.779	0.094	128.4	0.4
2000	0.6544	29.490	0.089	0.00283	0.00060	0.00127	0.00014	1.3	0.00519	0.00110	0.00035	0.00004	29.085	0.097	125.5	0.4
2500	0.7752	29.528	0.088	0.00234	0.00043	0.00075	0.00008	0.8	0.00430	0.00079	0.00038	0.00003	29.276	0.090	126.3	0.4
3000	0.8800	29.625	0.099	0.00806	0.00055	0.00091	0.00012	0.9	0.01479	0.00101	0.00036	0.00003	29.329	0.104	126.5	0.4
4000	0.9706	29.452	0.106	0.08768	0.00066	0.00122	0.00010	1.2	0.16090	0.00120	0.00041	0.00003	29.072	0.109	125.4	0.5
5000	0.9899	29.498	0.170	0.02662	0.00320	0.00346	0.00042	3.5	0.04884	0.00588	0.00039	0.00013	28.449	0.208	122.8	0.9
8000	1.0000	32.569	0.251	0.01678	0.00590	0.01168	0.00102	10.6	0.03078	0.01082	0.00038	0.00021	29.090	0.385	125.5	1.6
Integrated		29.905	0.029	0.00747	0.00025	0.00291	0.00004	2.9	0.01370	0.00047	0.00031	0.00001	29.018	0.031	125.2	0.3

UAF114-33 04Z296A WM#3 04-03C05 USGSGOLD

Weighted average of J from standards = 0.002476 +/- 0.000006

Laser (mW)	Cum. ³⁹ Ar	⁴⁰ Ar/ ³⁹ Ar measured	+/-	³⁷ Ar/ ³⁹ Ar measured	+/-	³⁶ Ar/ ³⁹ Ar measured	+/-	% Atm. ⁴⁰ Ar	Ca/K	+/-	Cl/K	+/-	⁴⁰ Ar*/ ³⁹ Ar _K	+/-	Age (Ma)	+/- (Ma)
200	0.0031	52.643	0.398	0.14788	0.02013	0.12704	0.00352	71.3	0.27136	0.03695	0.00927	0.00070	15.087	1.032	66.2	4.4
400	0.0142	38.085	0.181	0.14861	0.00382	0.04743	0.00075	36.8	0.27271	0.00702	0.00232	0.00011	24.056	0.259	104.4	1.1
600	0.0516	30.041	0.099	0.15910	0.00226	0.01038	0.00030	10.2	0.29195	0.00415	0.00101	0.00006	26.959	0.130	116.6	0.5
800	0.1162	30.667	0.081	0.01411	0.00044	0.00423	0.00011	4.1	0.02589	0.00081	0.00041	0.00003	29.389	0.086	126.7	0.4
1000	0.1966	30.640	0.121	0.01167	0.00021	0.00283	0.00008	2.7	0.02141	0.00039	0.00043	0.00002	29.777	0.123	128.4	0.5
1250	0.2903	31.078	0.174	0.01165	0.00033	0.00223	0.00006	2.1	0.02138	0.00060	0.00044	0.00002	30.393	0.174	130.9	0.7
1500	0.3848	30.409	0.147	0.00784	0.00037	0.00234	0.00007	2.3	0.01438	0.00067	0.00044	0.00002	29.691	0.147	128.0	0.6
1750	0.4821	30.761	0.128	0.00251	0.00031	0.00196	0.00008	1.9	0.00461	0.00058	0.00043	0.00002	30.154	0.130	129.9	0.5
2000	0.5798	30.261	0.176	0.00282	0.00034	0.00147	0.00006	1.4	0.00518	0.00063	0.00042	0.00001	29.798	0.176	128.4	0.7
2500	0.7042	29.885	0.154	0.00492	0.00020	0.00155	0.00005	1.5	0.00903	0.00036	0.00042	0.00002	29.399	0.154	126.8	0.6
3000	0.8286	30.271	0.151	0.00395	0.00023	0.00163	0.00005	1.6	0.00725	0.00043	0.00041	0.00002	29.761	0.151	128.3	0.6

4000	0.9709	29.350	0.173	0.00810	0.00026	0.00142	0.00004	1.4	0.01486	0.00048	0.00039	0.00001	28.901	0.173	124.7	0.7
5000	0.9896	29.644	0.072	0.03378	0.00199	0.00207	0.00033	2.1	0.06199	0.00364	0.00033	0.00008	29.007	0.120	125.1	0.5
8000	1.0000	29.515	0.299	0.18546	0.00329	0.00674	0.00051	6.7	0.34034	0.00603	0.00056	0.00013	27.512	0.327	118.9	1.4
Integrated		30.410	0.049	0.01708	0.00015	0.00328	0.00003	3.2	0.03133	0.00028	0.00049	0.00001	29.414	0.049	126.8	0.4

UAF116-52 04Z156 WM#1 USGSGOLD

Weighted average of J from standards = 0.002450 +/- 0.000006

Laser (mW)	Cum. ³⁹ Ar	⁴⁰ Ar/ ³⁹ Ar measured	+/-	³⁷ Ar/ ³⁹ Ar measured	+/-	³⁶ Ar/ ³⁹ Ar measured	+/-	% Atm. ⁴⁰ Ar	Ca/K	+/-	Cl/K	+/-	⁴⁰ Ar*/ ³⁹ Ar _K	+/-	Age (Ma)	+/- (Ma)
300	0.0053	42.635	0.789	0.30600	0.10800	0.05890	0.00264	40.8	0.56158	0.19825	0.00133	0.00041	25.229	0.976	108.2	4.1
600	0.0297	29.403	0.639	0.05170	0.02367	0.01239	0.00054	12.4	0.09486	0.04344	0.00041	0.00014	25.718	0.623	110.2	2.6
900	0.0797	27.888	0.236	-0.00453	0.01456	0.00532	0.00026	5.6	-0.00831	0.02672	0.00022	0.00007	26.287	0.241	112.6	1.0
1000	0.1173	27.413	0.333	0.00060	0.01638	0.00423	0.00036	4.6	0.00110	0.03006	0.00017	0.00007	26.133	0.342	111.9	1.4
1100	0.1905	27.766	0.125	-0.02013	0.01112	0.00357	0.00024	3.8	-0.03693	0.02041	0.00024	0.00005	26.680	0.141	114.2	0.6
1200	0.2595	27.232	0.105	-0.00604	0.00931	0.00313	0.00023	3.4	-0.01109	0.01708	0.00020	0.00007	26.278	0.124	112.5	0.5
1300	0.3189	27.387	0.099	-0.00508	0.01197	0.00374	0.00022	4.0	-0.00932	0.02196	0.00009	0.00005	26.251	0.116	112.4	0.5
1500	0.3905	27.263	0.081	-0.01502	0.01082	0.00292	0.00023	3.2	-0.02756	0.01985	0.00024	0.00004	26.370	0.104	112.9	0.4
1700	0.4527	27.511	0.067	-0.02069	0.01118	0.00351	0.00022	3.8	-0.03795	0.02051	0.00008	0.00004	26.444	0.091	113.2	0.4
2000	0.5196	27.451	0.051	-0.01671	0.01317	0.00354	0.00019	3.8	-0.03066	0.02416	0.00018	0.00005	26.374	0.076	112.9	0.3
2300	0.5819	27.308	0.044	-0.00542	0.01156	0.00324	0.00020	3.5	-0.00995	0.02122	0.00014	0.00005	26.321	0.073	112.7	0.3
2600	0.6193	28.172	0.094	0.00753	0.01776	0.00608	0.00039	6.4	0.01382	0.03259	0.00018	0.00008	26.346	0.146	112.8	0.6
3500	0.6915	27.284	0.051	0.00062	0.01113	0.00299	0.00026	3.2	0.00114	0.02042	0.00016	0.00004	26.372	0.091	112.9	0.4
8000	1.0000	27.425	0.068	0.02660	0.00947	0.00245	0.00014	2.6	0.04881	0.01738	0.00025	0.00003	26.675	0.079	114.2	0.3
Integrated		27.592	0.035	0.00520	0.00389	0.00380	0.00007	4.1	0.00955	0.00714	0.00021	0.00002	26.439	0.040	113.2	0.3

UAF110-24 04Z638A WM#1 09-25B04 USGSGOLD

Weighted average of J from standards = 0.002478 +/- 0.000013

Laser (mW)	Cum. ³⁹ Ar	⁴⁰ Ar/ ³⁹ Ar measured	+/-	³⁷ Ar/ ³⁹ Ar measured	+/-	³⁶ Ar/ ³⁹ Ar measured	+/-	% Atm. ⁴⁰ Ar	Ca/K	+/-	Cl/K	+/-	⁴⁰ Ar*/ ³⁹ Ar _K	+/-	Age (Ma)	+/- (Ma)
150	0.0013	68.737	1.550	0.11618	0.02221	0.21423	0.02345	92.1	0.21318	0.04077	0.01306	0.00279	5.412	6.786	24.0	29.9
300	0.0041	44.491	0.448	0.06552	0.00870	0.06793	0.00885	45.1	0.12022	0.01596	0.00275	0.00124	24.396	2.623	105.9	11.1
450	0.0115	30.405	0.168	0.28021	0.00457	0.02121	0.00307	20.6	0.51425	0.00838	0.00143	0.00053	24.133	0.918	104.8	3.9
600	0.0285	26.659	0.102	0.14514	0.00250	0.00864	0.00141	9.5	0.26633	0.00460	0.00059	0.00017	24.091	0.428	104.6	1.8
750	0.0607	26.534	0.101	0.01447	0.00092	0.00567	0.00072	6.3	0.02655	0.00169	0.00055	0.00012	24.830	0.235	107.7	1.0
900	0.1283	27.004	0.097	0.00517	0.00051	0.00303	0.00028	3.3	0.00948	0.00094	0.00032	0.00007	26.081	0.126	113.0	0.5

1150	0.2491	27.416	0.118	0.00386	0.00038	0.00215	0.00014	2.3	0.00708	0.00070	0.00033	0.00005	26.751	0.123	115.8	0.5
1500	0.4195	27.226	0.092	0.00200	0.00023	0.00157	0.00014	1.7	0.00367	0.00042	0.00036	0.00003	26.734	0.100	115.7	0.4
2000	0.5724	26.829	0.086	0.00187	0.00028	0.00160	0.00013	1.8	0.00342	0.00051	0.00031	0.00004	26.327	0.094	114.0	0.4
2500	0.6819	26.703	0.087	0.00332	0.00025	0.00232	0.00013	2.6	0.00610	0.00047	0.00045	0.00005	25.988	0.094	112.6	0.4
3000	0.7705	26.636	0.095	0.00379	0.00025	0.00200	0.00021	2.2	0.00696	0.00046	0.00045	0.00005	26.017	0.113	112.7	0.5
4500	0.9087	26.612	0.094	0.00938	0.00022	0.00180	0.00014	2.0	0.01720	0.00041	0.00034	0.00004	26.052	0.103	112.8	0.4
8000	1.0000	26.636	0.090	0.01497	0.00052	0.00313	0.00021	3.5	0.02747	0.00095	0.00044	0.00004	25.683	0.109	111.3	0.5
Integrated		27.019	0.033	0.01015	0.00013	0.00290	0.00008	3.2	0.01862	0.00023	0.00041	0.00002	26.135	0.040	113.2	0.6

UAF110-24 04Z638A WM#2 09-28B04 USGSGOLD

Weighted average of J from standards = 0.002478 +/- 0.000013

Laser (mW)	Cum. ³⁹ Ar	⁴⁰ Ar/ ³⁹ Ar measured	+/-	³⁷ Ar/ ³⁹ Ar measured	+/-	³⁶ Ar/ ³⁹ Ar measured	+/-	% Atm. ⁴⁰ Ar	Ca/K	+/-	Cl/K	+/-	⁴⁰ Ar*/ ³⁹ Ar _K	+/-	Age (Ma)	+/- (Ma)
150	0.0008	64.227	1.786	0.14072	0.02629	0.24468	0.02216	112.6	0.25823	0.04826	0.00758	0.00453	-8.096	6.262	-36.6	28.6
300	0.0026	47.048	0.679	0.09916	0.01220	0.11305	0.00869	71.0	0.18195	0.02240	0.00356	0.00205	13.622	2.542	59.9	11.0
450	0.0072	30.639	0.210	0.15644	0.00571	0.02747	0.00355	26.5	0.28707	0.01048	0.00040	0.00058	22.508	1.061	97.9	4.5
600	0.0175	27.181	0.162	0.23090	0.00332	0.01197	0.00137	13.0	0.42373	0.00609	0.00037	0.00024	23.637	0.430	102.7	1.8
750	0.0384	27.055	0.131	0.06703	0.00148	0.00720	0.00069	7.9	0.12300	0.00272	0.00042	0.00015	24.904	0.240	108.0	1.0
900	0.0894	27.325	0.102	0.01058	0.00053	0.00335	0.00027	3.6	0.01941	0.00097	0.00042	0.00007	26.308	0.129	113.9	0.5
1150	0.1779	26.578	0.109	0.01311	0.00030	0.00283	0.00015	3.1	0.02406	0.00055	0.00049	0.00004	25.714	0.116	111.4	0.5
1500	0.2896	26.945	0.096	0.00303	0.00023	0.00225	0.00016	2.5	0.00555	0.00041	0.00043	0.00004	26.253	0.106	113.7	0.4
2000	0.3862	26.874	0.114	0.00311	0.00029	0.00232	0.00015	2.6	0.00571	0.00053	0.00036	0.00004	26.160	0.121	113.3	0.5
2500	0.4853	26.422	0.098	0.00248	0.00024	0.00196	0.00017	2.2	0.00454	0.00044	0.00035	0.00004	25.815	0.110	111.9	0.5
3000	0.5803	26.568	0.098	0.00291	0.00030	0.00185	0.00015	2.1	0.00534	0.00055	0.00035	0.00003	25.993	0.107	112.6	0.5
4500	0.7782	26.778	0.339	0.00312	0.00012	0.00188	0.00008	2.1	0.00573	0.00022	0.00039	0.00003	26.195	0.339	113.4	1.4
8000	1.0000	26.065	0.225	0.00239	0.00009	0.00158	0.00009	1.8	0.00439	0.00017	0.00042	0.00002	25.569	0.226	110.8	1.0
Integrated		26.696	0.087	0.00879	0.00009	0.00278	0.00006	3.1	0.01614	0.00017	0.00041	0.00001	25.846	0.088	112.0	0.7

UAF116-53 04Z641 WM#1 USGSGOLD

Weighted average of J from standards = 0.002450 +/- 0.000006

Laser (mW)	Cum. ³⁹ Ar	⁴⁰ Ar/ ³⁹ Ar measured	+/-	³⁷ Ar/ ³⁹ Ar measured	+/-	³⁶ Ar/ ³⁹ Ar measured	+/-	% Atm. ⁴⁰ Ar	Ca/K	+/-	Cl/K	+/-	⁴⁰ Ar*/ ³⁹ Ar _K	+/-	Age (Ma)	+/- (Ma)
300	0.0015	107.100	6.155	1.55140	3.97722	0.39986	0.05664	110.2	2.84948	7.31242	0.01266	0.00963	-10.982	15.336	-49.2	69.7
600	0.0085	43.263	1.019	1.03779	0.80553	0.10208	0.01189	69.6	1.90549	1.48004	0.00243	0.00196	13.157	3.486	57.2	14.9
900	0.0446	29.750	0.661	0.39232	0.18331	0.02528	0.00253	25.0	0.72005	0.33652	0.00088	0.00047	22.287	0.938	95.9	3.9

1200	0.1406	27.264	0.600	0.13794	0.14554	0.01212	0.00252	13.1	0.25312	0.26710	0.00052	0.00051	23.667	0.928	101.7	3.9
1500	0.3089	25.622	0.249	-0.01706	0.03486	0.00548	0.00060	6.3	-0.03131	0.06397	0.00050	0.00010	23.972	0.299	102.9	1.3
1800	0.4111	25.341	0.150	0.02134	0.05484	0.00555	0.00118	6.5	0.03916	0.10062	0.00045	0.00020	23.675	0.377	101.7	1.6
2200	0.5637	25.737	0.155	-0.01853	0.03565	0.00619	0.00080	7.1	-0.03401	0.06541	0.00031	0.00012	23.876	0.280	102.5	1.2
3000	0.6646	25.980	0.145	0.13039	0.05737	0.00780	0.00095	8.8	0.23927	0.10528	0.00026	0.00014	23.659	0.312	101.6	1.3
3700	0.7636	25.461	0.132	-0.01739	0.05871	0.00495	0.00079	5.8	-0.03191	0.10773	0.00025	0.00015	23.970	0.266	102.9	1.1
8000	1.0000	25.163	0.363	0.01728	0.02240	0.00464	0.00034	5.5	0.03171	0.04110	0.00023	0.00009	23.764	0.367	102.1	1.5
Integrated		26.078	0.120	0.04902	0.02234	0.00821	0.00038	9.3	0.08994	0.04099	0.00040	0.00007	23.627	0.159	101.5	0.7

UAF110-20 04RN319A WM#1 09-22C04 USGSGOLD

Weighted average of J from standards = 0.002478 +/- 0.000013

Laser (mW)	Cum. ³⁹ Ar	⁴⁰ Ar/ ³⁹ Ar measured	+/-	³⁷ Ar/ ³⁹ Ar measured	+/-	³⁶ Ar/ ³⁹ Ar measured	+/-	% Atm. ⁴⁰ Ar	Ca/K	+/-	Cl/K	+/-	⁴⁰ Ar*/ ³⁹ Ar _K	+/-	Age (Ma)	+/- (Ma)
200	0.0266	32.398	0.276	-0.00254	0.00264	0.03275	0.00210	29.9	-0.00466	0.00485	0.00104	0.00042	22.690	0.652	98.7	2.8
400	0.1872	26.841	0.112	0.00138	0.00044	0.00429	0.00044	4.7	0.00254	0.00081	0.00045	0.00007	25.544	0.171	110.7	0.7
600	0.4700	25.901	0.102	-0.00018	0.00025	0.00262	0.00021	3.0	-0.00034	0.00045	0.00036	0.00006	25.097	0.118	108.8	0.5
800	0.6877	25.563	0.099	0.00038	0.00063	0.00253	0.00026	2.9	0.00069	0.00116	0.00036	0.00005	24.788	0.124	107.5	0.5
1000	0.7945	25.357	0.115	0.00201	0.00076	0.00234	0.00079	2.7	0.00369	0.00140	0.00018	0.00011	24.636	0.258	106.9	1.1
1200	0.8334	25.802	0.191	0.00147	0.00239	0.00319	0.00239	3.7	0.00270	0.00438	-0.00028	0.00028	24.831	0.729	107.7	3.1
1500	0.8769	25.617	0.170	0.00373	0.00183	0.00404	0.00182	4.7	0.00684	0.00336	0.00046	0.00030	24.396	0.563	105.9	2.4
1750	0.9089	25.396	0.210	0.00263	0.00279	0.00406	0.00301	4.7	0.00482	0.00511	0.00020	0.00041	24.169	0.912	104.9	3.9
2000	0.9344	25.575	0.164	0.00189	0.00316	0.00269	0.00362	3.1	0.00347	0.00581	0.00009	0.00044	24.752	1.083	107.4	4.6
2500	0.9646	25.157	0.148	-0.00128	0.00244	0.00246	0.00186	2.9	-0.00234	0.00447	0.00064	0.00052	24.400	0.567	105.9	2.4
3000	0.9808	25.716	0.279	-0.00970	0.00526	0.00379	0.00303	4.4	-0.01779	0.00965	0.00082	0.00098	24.565	0.934	106.6	3.9
4000	0.9919	25.486	0.304	-0.00956	0.00676	0.00796	0.00619	9.2	-0.01754	0.01240	0.00138	0.00146	23.105	1.851	100.4	7.8
8000	1.0000	25.413	0.386	0.01153	0.01175	0.00475	0.00719	5.5	0.02116	0.02156	0.00369	0.00167	23.981	2.156	104.1	9.1
Integrated		26.019	0.045	0.00054	0.00031	0.00386	0.00026	4.4	0.00100	0.00057	0.00040	0.00005	24.848	0.089	107.8	0.7

UAF110-21 04RN351B WM#1 09-25A04 USGSGOLD

Weighted average of J from standards = 0.002478 +/- 0.000013

Laser (mW)	Cum. ³⁹ Ar	⁴⁰ Ar/ ³⁹ Ar measured	+/-	³⁷ Ar/ ³⁹ Ar measured	+/-	³⁶ Ar/ ³⁹ Ar measured	+/-	% Atm. ⁴⁰ Ar	Ca/K	+/-	Cl/K	+/-	⁴⁰ Ar*/ ³⁹ Ar _K	+/-	Age (Ma)	+/- (Ma)
150	0.0006	19.817	0.797	0.03914	0.03270	0.11426	0.03030	170.6	0.07183	0.06001	0.00623	0.00619	-13.972	8.872	-63.6	41.1
300	0.0025	27.017	0.357	0.01484	0.00996	0.05757	0.00787	63.0	0.02723	0.01828	0.00196	0.00145	9.976	2.319	44.1	10.1
450	0.0070	24.286	0.240	0.00446	0.00395	0.01876	0.00401	22.8	0.00819	0.00725	0.00222	0.00081	18.715	1.199	81.8	5.1

600	0.0169	25.374	0.136	0.00137	0.00271	0.00560	0.00149	6.5	0.00251	0.00497	0.00060	0.00029	23.690	0.459	102.9	1.9
750	0.0323	26.037	0.125	0.00025	0.00093	0.00348	0.00096	4.0	0.00046	0.00171	0.00032	0.00017	24.979	0.309	108.3	1.3
900	0.0537	26.042	0.153	0.00301	0.00131	0.00316	0.00067	3.6	0.00552	0.00241	0.00078	0.00013	25.081	0.249	108.8	1.1
1150	0.1048	25.572	0.101	0.00158	0.00036	0.00189	0.00026	2.2	0.00291	0.00065	0.00070	0.00005	24.985	0.126	108.4	0.5
1500	0.2568	25.182	0.081	0.00051	0.00020	0.00094	0.00011	1.1	0.00094	0.00037	0.00065	0.00004	24.874	0.087	107.9	0.4
2000	0.5689	24.891	0.183	0.00082	0.00010	0.00064	0.00005	0.8	0.00151	0.00018	0.00063	0.00002	24.674	0.183	107.1	0.8
2500	0.6819	25.065	0.082	0.00012	0.00020	0.00050	0.00017	0.6	0.00022	0.00037	0.00058	0.00003	24.887	0.096	107.9	0.4
3000	0.7395	25.189	0.100	0.00067	0.00038	0.00108	0.00030	1.3	0.00123	0.00070	0.00062	0.00004	24.843	0.134	107.8	0.6
4500	0.8712	24.984	0.089	0.00030	0.00022	0.00034	0.00015	0.4	0.00055	0.00040	0.00065	0.00002	24.854	0.099	107.8	0.4
8000	1.0000	25.063	0.091	0.00008	0.00014	0.00047	0.00015	0.6	0.00015	0.00026	0.00070	0.00003	24.895	0.102	108.0	0.4
Integrated		25.086	0.062	0.00067	0.00008	0.00110	0.00006	1.3	0.00123	0.00016	0.00065	0.00001	24.732	0.064	107.3	0.6

UAF110-22 04RN355C WM#1 09-23B04 USGSGOLD

Weighted average of J from standards = 0.002478 +/- 0.000013

Laser (mW)	Cum. ³⁹ Ar	⁴⁰ Ar/ ³⁹ Ar measured	+/-	³⁷ Ar/ ³⁹ Ar measured	+/-	³⁶ Ar/ ³⁹ Ar measured	+/-	% Atm. ⁴⁰ Ar	Ca/K	+/-	Cl/K	+/-	⁴⁰ Ar*/ ³⁹ Ar _K	+/-	Age (Ma)	+/- (Ma)
150	0.0009	24.253	0.463	0.05129	0.01169	0.10756	0.00760	131.2	0.09412	0.02145	0.00511	0.00109	-7.557	2.228	-34.1	10.2
300	0.0039	34.149	1.055	0.02556	0.00277	0.05926	0.00354	51.3	0.04691	0.00508	0.00340	0.00045	16.611	1.271	72.8	5.5
450	0.0114	25.286	0.709	0.06124	0.00261	0.01164	0.00107	13.6	0.11237	0.00479	0.00128	0.00016	21.823	0.725	95.0	3.1
600	0.0306	25.546	0.156	0.22028	0.00172	0.00371	0.00037	4.2	0.40424	0.00316	0.00046	0.00008	24.442	0.188	106.1	0.8
750	0.0633	26.070	0.105	0.03973	0.00036	0.00418	0.00020	4.7	0.07289	0.00067	0.00044	0.00004	24.810	0.120	107.6	0.5
900	0.1191	25.304	0.084	0.00289	0.00014	0.00134	0.00010	1.6	0.00530	0.00025	0.00036	0.00004	24.880	0.088	107.9	0.4
1150	0.2393	24.921	0.278	0.00276	0.00007	0.00104	0.00004	1.2	0.00506	0.00014	0.00041	0.00002	24.586	0.278	106.7	1.2
1500	0.4683	24.817	0.199	0.00185	0.00005	0.00061	0.00002	0.7	0.00339	0.00009	0.00042	0.00001	24.609	0.199	106.8	0.8
2000	0.7758	24.633	0.388	0.00123	0.00003	0.00060	0.00002	0.7	0.00226	0.00006	0.00044	0.00003	24.427	0.388	106.0	1.6
2500	0.9076	24.701	0.201	0.00115	0.00007	0.00065	0.00004	0.8	0.00212	0.00014	0.00040	0.00002	24.480	0.201	106.2	0.9
3000	0.9410	24.909	0.090	0.00105	0.00031	0.00091	0.00015	1.1	0.00193	0.00057	0.00031	0.00004	24.610	0.100	106.8	0.4
4500	0.9768	24.911	0.093	0.00085	0.00024	0.00075	0.00019	0.9	0.00155	0.00044	0.00035	0.00005	24.661	0.108	107.0	0.5
8000	1.0000	25.051	0.121	0.00098	0.00046	0.00133	0.00019	1.6	0.00180	0.00085	0.00031	0.00008	24.630	0.132	106.9	0.6
Integrated		24.883	0.135	0.00764	0.00005	0.00127	0.00002	1.5	0.01402	0.00009	0.00043	0.00001	24.480	0.135	106.2	0.8

UAF110-22 04RN355C WM#2 09-28C04 USGSGOLD

Weighted average of J from standards = 0.002478 +/- 0.000013

Laser (mW)	Cum. ³⁹ Ar	⁴⁰ Ar/ ³⁹ Ar measured	+/-	³⁷ Ar/ ³⁹ Ar measured	+/-	³⁶ Ar/ ³⁹ Ar measured	+/-	% Atm. ⁴⁰ Ar	Ca/K	+/-	Cl/K	+/-	⁴⁰ Ar*/ ³⁹ Ar _K	+/-	Age (Ma)	+/- (Ma)
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150	0.0002	13.889	1.023	0.22564	0.11181	0.18488	0.03792	394.0	0.41409	0.20521	0.01156	0.00963	-40.761	10.904	-192.1	54.2
300	0.0014	30.397	0.312	0.04890	0.01669	0.07707	0.00633	75.0	0.08972	0.03063	0.00476	0.00145	7.597	1.860	33.6	8.2
450	0.0032	29.648	0.314	0.02855	0.01062	0.03005	0.00524	30.0	0.05239	0.01949	0.00173	0.00102	20.742	1.563	90.4	6.6
600	0.0084	25.102	0.143	0.02321	0.00413	0.00869	0.00158	10.2	0.04259	0.00758	0.00106	0.00031	22.509	0.484	97.9	2.1
750	0.0204	24.860	0.106	0.04757	0.00195	0.00336	0.00064	4.0	0.08728	0.00358	0.00055	0.00014	23.843	0.216	103.5	0.9
900	0.0399	25.030	0.099	0.04454	0.00102	0.00321	0.00043	3.8	0.08172	0.00188	0.00032	0.00012	24.056	0.160	104.4	0.7
1150	0.0692	25.010	0.092	0.01437	0.00050	0.00325	0.00038	3.8	0.02637	0.00091	0.00046	0.00008	24.021	0.144	104.3	0.6
1500	0.1341	24.933	0.091	0.00346	0.00027	0.00143	0.00014	1.7	0.00635	0.00050	0.00039	0.00004	24.481	0.098	106.2	0.4
2000	0.2973	24.641	0.244	0.00141	0.00010	0.00105	0.00005	1.3	0.00259	0.00018	0.00043	0.00002	24.303	0.244	105.5	1.0
2500	0.5895	24.747	0.185	0.00074	0.00005	0.00059	0.00003	0.7	0.00137	0.00009	0.00044	0.00003	24.544	0.185	106.5	0.8
3000	0.8190	24.618	0.211	0.00107	0.00006	0.00066	0.00004	0.8	0.00196	0.00010	0.00041	0.00002	24.395	0.211	105.9	0.9
4500	0.9447	24.702	0.357	0.00128	0.00012	0.00079	0.00005	0.9	0.00234	0.00022	0.00042	0.00003	24.439	0.356	106.1	1.5
8000	1.0000	24.887	0.101	0.00098	0.00034	0.00103	0.00016	1.2	0.00181	0.00063	0.00036	0.00003	24.553	0.112	106.5	0.5
Integrated		24.744	0.095	0.00327	0.00007	0.00117	0.00003	1.4	0.00600	0.00012	0.00043	0.00001	24.370	0.095	105.8	0.7

UAF110-23 04RN500C WM#1 09-23C04 USGSGOLD

Weighted average of J from standards = 0.002478 +/- 0.000013

Laser (mW)	Cum. ³⁹ Ar	⁴⁰ Ar/ ³⁹ Ar measured	+/-	³⁷ Ar/ ³⁹ Ar measured	+/-	³⁶ Ar/ ³⁹ Ar measured	+/-	% Atm. ⁴⁰ Ar	Ca/K	+/-	Cl/K	+/-	⁴⁰ Ar*/ ³⁹ Ar _K	+/-	Age (Ma)	+/- (Ma)
150	0.0055	56.602	4.224	0.42498	0.07859	0.41721	0.05062	217.9	0.78000	0.14429	0.01229	0.00825	-66.700	12.822	-325.9	68.7
300	0.0202	46.236	1.173	0.38477	0.02798	0.15250	0.01232	97.5	0.70618	0.05136	0.01053	0.00316	1.173	3.466	5.2	15.5
450	0.0462	35.686	0.430	2.61668	0.03474	0.08383	0.00732	68.9	4.80945	0.06396	0.00374	0.00159	11.102	2.154	49.0	9.4
600	0.0756	36.244	0.490	7.34389	0.10449	0.07443	0.00616	59.2	13.53976	0.19356	0.00184	0.00157	14.844	1.819	65.2	7.8
750	0.1094	31.643	0.360	1.50824	0.01931	0.04183	0.00433	38.7	2.77014	0.03550	0.00093	0.00125	19.385	1.302	84.6	5.6
900	0.1760	30.687	0.268	0.18741	0.00518	0.02389	0.00221	23.0	0.34391	0.00951	0.00105	0.00076	23.616	0.686	102.6	2.9
1150	0.3323	30.868	0.171	0.13895	0.00241	0.01879	0.00118	18.0	0.25498	0.00443	0.00075	0.00027	25.298	0.380	109.7	1.6
1500	0.4633	30.533	0.153	0.25067	0.00326	0.01197	0.00122	11.5	0.46002	0.00598	0.00154	0.00039	26.991	0.385	116.8	1.6
2000	0.5535	30.340	0.197	0.52315	0.00510	0.01653	0.00221	16.0	0.96024	0.00936	0.00156	0.00051	25.475	0.676	110.4	2.8
2500	0.6038	31.160	0.232	0.40855	0.00932	0.01434	0.00411	13.5	0.74984	0.01711	0.00039	0.00081	26.932	1.232	116.5	5.2
3000	0.6796	29.705	0.185	0.15301	0.00592	0.01516	0.00277	15.1	0.28078	0.01086	0.00055	0.00058	25.210	0.836	109.3	3.5
4500	0.8588	29.370	0.164	0.21180	0.00298	0.00578	0.00144	5.8	0.38868	0.00547	0.00074	0.00018	27.652	0.454	119.5	1.9
8000	1.0000	29.449	0.148	0.34303	0.00392	0.00507	0.00173	5.0	0.62956	0.00719	0.00102	0.00031	27.953	0.530	120.8	2.2
Integrated		30.900	0.065	0.57660	0.00213	0.02153	0.00071	20.5	1.05838	0.00391	0.00127	0.00016	24.562	0.216	106.6	1.1

UAF110-23 04RN500C WM#2 09-27C04 USGSGOLD

Weighted average of J from standards = 0.002478 +/- 0.000013

Laser (mW)	Cum. ³⁹ Ar	⁴⁰ Ar/ ³⁹ Ar measured	+/-	³⁷ Ar/ ³⁹ Ar measured	+/-	³⁶ Ar/ ³⁹ Ar measured	+/-	% Atm. ⁴⁰ Ar	Ca/K	+/-	Cl/K	+/-	⁴⁰ Ar*/ ³⁹ Ar _K	+/-	Age (Ma)	+/- (Ma)
150	0.0025	85.931	8.132	0.74901	0.15417	0.75139	0.10124	258.4	1.37499	0.28315	0.05390	0.01548	-136.144	24.918	-742.1	168.1
300	0.0097	60.039	2.961	0.60296	0.05589	0.39937	0.03230	196.6	1.10679	0.10264	0.02883	0.00709	-57.982	8.095	-279.8	42.3
450	0.0222	45.435	1.263	1.25360	0.04675	0.20101	0.01319	130.6	2.30207	0.08592	0.01419	0.00286	-13.910	3.568	-63.3	16.5
600	0.0419	37.082	0.540	2.31245	0.03770	0.09884	0.00822	78.4	4.24943	0.06938	0.00708	0.00176	8.032	2.407	35.6	10.6
750	0.0658	32.207	0.425	1.63743	0.03209	0.05701	0.00641	52.0	3.00767	0.05900	0.00514	0.00136	15.471	1.898	67.9	8.2
900	0.0948	33.064	0.548	0.49228	0.01305	0.04411	0.00693	39.3	0.90356	0.02396	0.00106	0.00120	20.045	2.065	87.4	8.8
1150	0.1719	30.482	0.180	0.21065	0.00620	0.01948	0.00239	18.9	0.38657	0.01138	0.00041	0.00048	24.715	0.725	107.2	3.1
1500	0.4070	28.460	0.180	0.14089	0.00153	0.00836	0.00065	8.7	0.25854	0.00280	0.00036	0.00012	25.973	0.256	112.5	1.1
2000	0.6136	29.765	0.152	0.12074	0.00123	0.01049	0.00084	10.4	0.22155	0.00225	0.00021	0.00017	26.649	0.288	115.3	1.2
2500	0.7111	31.948	0.189	0.31619	0.00519	0.01571	0.00168	14.5	0.58029	0.00953	0.00075	0.00034	27.306	0.526	118.1	2.2
3000	0.7514	31.197	0.245	0.67159	0.00913	0.00549	0.00394	5.0	1.23282	0.01676	0.00159	0.00088	29.610	1.189	127.7	5.0
4500	0.8386	29.904	0.210	0.29924	0.00511	0.01002	0.00191	9.8	0.54918	0.00937	0.00081	0.00043	26.941	0.596	116.6	2.5
8000	1.0000	30.942	0.138	0.49728	0.00300	0.01209	0.00109	11.4	0.91273	0.00550	0.00077	0.00021	27.386	0.347	118.4	1.5
Integrated		30.839	0.072	0.35944	0.00158	0.02207	0.00061	21.1	0.65967	0.00289	0.00130	0.00013	24.322	0.192	105.6	1.0

UAF110-29 04SAH119A BI 09-24A04 SEWARD04

Weighted average of J from standards = 0.002478 +/- 0.000013

Laser (mW)	Cum. ³⁹ Ar	⁴⁰ Ar/ ³⁹ Ar measured	+/-	³⁷ Ar/ ³⁹ Ar measured	+/-	³⁶ Ar/ ³⁹ Ar measured	+/-	% Atm. ⁴⁰ Ar	Ca/K	+/-	Cl/K	+/-	⁴⁰ Ar*/ ³⁹ Ar _K	+/-	Age (Ma)	+/- (Ma)
150	0.0021	41.350	1.169	0.25731	0.03357	0.12870	0.02025	92.0	0.47221	0.06162	0.01433	0.00384	3.311	5.902	14.7	26.2
300	0.0099	34.588	0.545	0.37847	0.01013	0.03910	0.00522	33.3	0.69460	0.01860	0.00228	0.00105	23.041	1.576	100.2	6.7
450	0.0337	27.995	0.164	0.38891	0.00667	0.01274	0.00147	13.4	0.71377	0.01225	0.00184	0.00047	24.236	0.459	105.2	1.9
600	0.0793	26.900	0.139	0.10943	0.00253	0.00751	0.00079	8.2	0.20081	0.00464	0.00101	0.00020	24.663	0.268	107.0	1.1
750	0.1170	26.965	0.174	0.03055	0.00149	0.00556	0.00086	6.1	0.05605	0.00274	0.00082	0.00028	25.297	0.304	109.7	1.3
900	0.1479	26.782	0.118	0.01906	0.00185	0.00903	0.00115	10.0	0.03496	0.00340	0.00065	0.00030	24.087	0.358	104.6	1.5
1150	0.1976	26.408	0.143	0.02082	0.00176	0.00591	0.00077	6.6	0.03821	0.00324	0.00069	0.00020	24.634	0.266	106.9	1.1
1500	0.3014	25.856	0.158	0.01622	0.00066	0.00300	0.00029	3.4	0.02977	0.00121	0.00068	0.00010	24.942	0.176	108.2	0.7
2000	0.4505	25.418	0.126	0.01440	0.00040	0.00239	0.00028	2.8	0.02642	0.00073	0.00060	0.00007	24.683	0.149	107.1	0.6
2500	0.6170	25.183	0.123	0.03715	0.00051	0.00163	0.00025	1.9	0.06816	0.00094	0.00069	0.00006	24.674	0.141	107.1	0.6
3000	0.7479	25.086	0.108	0.06536	0.00108	0.00167	0.00027	1.9	0.11994	0.00198	0.00080	0.00009	24.570	0.134	106.6	0.6
4500	0.9153	25.166	0.095	0.03213	0.00053	0.00127	0.00026	1.5	0.05896	0.00097	0.00088	0.00006	24.764	0.121	107.4	0.5
8000	1.0000	25.791	0.137	0.04211	0.00108	0.00337	0.00057	3.9	0.07726	0.00198	0.00092	0.00012	24.771	0.215	107.5	0.9
Integrated		25.753	0.043	0.04804	0.00034	0.00366	0.00014	4.2	0.08816	0.00062	0.00083	0.00004	24.648	0.058	106.9	0.6

UAF116-40 04MBW384C BI#1 USGSGOLD

Weighted average of J from standards = 0.002450 +/- 0.000006

Laser (mW)	Cum. ³⁹ Ar	⁴⁰ Ar/ ³⁹ Ar measured	+/-	³⁷ Ar/ ³⁹ Ar measured	+/-	³⁶ Ar/ ³⁹ Ar measured	+/-	% Atm. ⁴⁰ Ar	Ca/K	+/-	Cl/K	+/-	⁴⁰ Ar*/ ³⁹ Ar _K	+/-	Age (Ma)	+/- (Ma)
300	0.0035	1251.540	18.645	0.40829	0.47857	4.18465	0.06631	98.8	0.74936	0.87858	0.04923	0.00291	14.981	10.185	65.0	43.4
600	0.0122	513.650	3.810	2.65168	0.21618	1.67752	0.01400	96.5	4.87388	0.39803	0.03960	0.00110	18.146	2.458	78.5	10.4
900	0.0188	235.145	2.619	4.76644	0.24970	0.73961	0.01274	92.8	8.77298	0.46102	0.02683	0.00188	16.972	3.327	73.5	14.1
1200	0.0412	167.885	0.715	3.56411	0.07547	0.50598	0.00345	88.9	6.55486	0.13912	0.03206	0.00063	18.652	0.987	80.6	4.2
1500	0.1826	65.083	0.153	1.01683	0.02141	0.15086	0.00074	68.4	1.86698	0.03933	0.03082	0.00012	20.564	0.217	88.7	0.9
1800	0.2225	49.497	0.217	0.77904	0.04376	0.09845	0.00133	58.7	1.43016	0.08037	0.02774	0.00043	20.444	0.415	88.2	1.7
2100	0.2953	43.532	0.165	0.60208	0.03585	0.08012	0.00089	54.3	1.10517	0.06582	0.02550	0.00036	19.880	0.265	85.8	1.1
2400	0.3783	32.529	0.154	0.69495	0.02559	0.04392	0.00104	39.8	1.27571	0.04699	0.02119	0.00015	19.584	0.329	84.5	1.4
2800	0.5668	31.120	0.047	0.64455	0.01601	0.03917	0.00035	37.1	1.18315	0.02940	0.02184	0.00010	19.572	0.108	84.5	0.5
3200	0.7073	24.539	0.111	0.59040	0.01445	0.01732	0.00042	20.7	1.08372	0.02653	0.01966	0.00017	19.444	0.155	83.9	0.7
8000	1.0000	22.121	0.044	0.80906	0.01075	0.00961	0.00016	12.6	1.48530	0.01974	0.01474	0.00006	19.324	0.061	83.4	0.3
Integrated		47.003	0.054	0.85359	0.00765	0.09284	0.00025	58.3	1.56708	0.01406	0.02169	0.00006	19.614	0.079	84.7	0.4

UAF116-41 04MBW525A BI#1 USGSGOLD

Weighted average of J from standards = 0.002450 +/- 0.000006

Laser (mW)	Cum. ³⁹ Ar	⁴⁰ Ar/ ³⁹ Ar measured	+/-	³⁷ Ar/ ³⁹ Ar measured	+/-	³⁶ Ar/ ³⁹ Ar measured	+/-	% Atm. ⁴⁰ Ar	Ca/K	+/-	Cl/K	+/-	⁴⁰ Ar*/ ³⁹ Ar _K	+/-	Age (Ma)	+/- (Ma)
300	0.0057	72.939	0.747	0.15219	0.08250	0.23207	0.00399	94.0	0.27927	0.15140	0.03351	0.00063	4.346	1.140	19.1	5.0
600	0.0241	30.926	0.128	0.07740	0.02700	0.05808	0.00073	55.5	0.14202	0.04955	0.02126	0.00022	13.741	0.222	59.7	1.0
900	0.0691	23.473	0.091	0.00886	0.00921	0.01487	0.00033	18.7	0.01625	0.01691	0.01168	0.00013	19.051	0.127	82.3	0.5
1200	0.1441	21.422	0.092	-0.00369	0.00662	0.00568	0.00021	7.9	-0.00677	0.01215	0.00925	0.00006	19.713	0.108	85.1	0.5
1500	0.2985	20.810	0.042	0.00712	0.00836	0.00345	0.00009	4.9	0.01306	0.01534	0.00813	0.00004	19.764	0.048	85.3	0.2
1800	0.4032	20.359	0.029	0.02361	0.00409	0.00230	0.00015	3.3	0.04332	0.00751	0.00729	0.00005	19.654	0.053	84.8	0.2
2100	0.4614	20.007	0.056	0.02247	0.00692	0.00175	0.00024	2.6	0.04124	0.01270	0.00630	0.00008	19.462	0.090	84.0	0.4
2500	0.6491	19.877	0.064	0.02891	0.00424	0.00144	0.00009	2.1	0.05305	0.00779	0.00606	0.00006	19.426	0.069	83.9	0.3
3000	0.7798	19.645	0.034	0.02457	0.00630	0.00126	0.00009	1.9	0.04509	0.01156	0.00477	0.00005	19.245	0.042	83.1	0.2
8000	1.0000	19.542	0.042	0.01291	0.00346	0.00079	0.00006	1.2	0.02368	0.00635	0.00420	0.00003	19.281	0.045	83.3	0.2
Integrated		20.760	0.020	0.01877	0.00219	0.00498	0.00005	7.1	0.03445	0.00402	0.00687	0.00002	19.262	0.024	83.2	0.2

UAF116-43 04MBW94A BI#1 USGSGOLD

Weighted average of J from standards = 0.002450 +/- 0.000006

Laser (mW)	Cum. ³⁹ Ar	⁴⁰ Ar/ ³⁹ Ar measured	+/-	³⁷ Ar/ ³⁹ Ar measured	+/-	³⁶ Ar/ ³⁹ Ar measured	+/-	% Atm. ⁴⁰ Ar	Ca/K	+/-	Cl/K	+/-	⁴⁰ Ar*/ ³⁹ Ar _K	+/-	Age (Ma)	+/- (Ma)
300	0.0013	349.962	6.368	4.49159	0.74316	1.16501	0.03343	98.3	8.26562	1.37160	0.00770	0.00301	6.029	9.083	26.5	39.6
600	0.0141	119.565	0.631	1.87558	0.07749	0.36108	0.00315	89.1	3.44563	0.14253	0.00374	0.00041	12.995	0.833	56.5	3.6
900	0.0192	88.762	1.008	1.73024	0.19752	0.25510	0.00529	84.8	3.17834	0.36324	0.00340	0.00064	13.496	1.385	58.7	5.9
1200	0.0320	76.918	0.383	1.26198	0.06151	0.20386	0.00249	78.2	2.31746	0.11305	0.00298	0.00030	16.757	0.697	72.6	3.0
1400	0.1331	40.230	0.076	0.71246	0.01516	0.07196	0.00039	52.8	1.30787	0.02784	0.00191	0.00006	19.000	0.124	82.1	0.5
1700	0.1506	44.875	0.393	0.68408	0.04308	0.08984	0.00149	59.1	1.25575	0.07911	0.00220	0.00023	18.358	0.507	79.4	2.1
2100	0.2033	32.439	0.088	0.57467	0.01724	0.04404	0.00054	40.0	1.05484	0.03165	0.00256	0.00010	19.446	0.172	84.0	0.7
2400	0.2930	27.455	0.061	0.50899	0.01369	0.02689	0.00032	28.8	0.93423	0.02514	0.00338	0.00007	19.525	0.105	84.3	0.4
2700	0.3963	26.644	0.049	0.71596	0.01160	0.02377	0.00032	26.2	1.31430	0.02131	0.00405	0.00007	19.654	0.102	84.8	0.4
3000	0.5648	21.146	0.062	0.88288	0.00517	0.00796	0.00014	10.8	1.62089	0.00950	0.00342	0.00004	18.843	0.071	81.4	0.3
4000	0.6316	21.859	0.040	0.99160	0.01122	0.01055	0.00035	13.9	1.82063	0.02062	0.00361	0.00008	18.800	0.108	81.2	0.5
8000	1.0000	20.176	0.038	1.72626	0.00921	0.00657	0.00013	9.0	3.17101	0.01693	0.00271	0.00004	18.357	0.052	79.4	0.2
Integrated		27.659	0.026	1.13986	0.00477	0.03056	0.00011	32.4	2.09303	0.00877	0.00302	0.00002	18.700	0.038	80.8	0.3

UAF110-19 03MBW390A WM#1 09-22B04 USGSGOLD

Weighted average of J from standards = 0.002478 +/- 0.000013

Laser (mW)	Cum. ³⁹ Ar	⁴⁰ Ar/ ³⁹ Ar measured	+/-	³⁷ Ar/ ³⁹ Ar measured	+/-	³⁶ Ar/ ³⁹ Ar measured	+/-	% Atm. ⁴⁰ Ar	Ca/K	+/-	Cl/K	+/-	⁴⁰ Ar*/ ³⁹ Ar _K	+/-	Age (Ma)	+/- (Ma)
200	0.0012	57.336	1.106	0.12477	0.02817	0.29865	0.01565	154.0	0.22896	0.05170	0.01201	0.00303	-30.937	4.380	-143.9	21.2
400	0.0061	37.111	0.303	0.02677	0.00478	0.05289	0.00309	42.1	0.04912	0.00877	0.00583	0.00056	21.457	0.924	93.4	3.9
600	0.0400	31.843	0.180	0.00452	0.00073	0.01403	0.00051	13.0	0.00830	0.00133	0.00144	0.00010	27.668	0.220	119.6	0.9
800	0.2509	30.774	0.291	0.00140	0.00011	0.00563	0.00011	5.4	0.00256	0.00020	0.00055	0.00004	29.083	0.288	125.5	1.2
1000	0.6524	30.988	0.229	0.00118	0.00006	0.00205	0.00005	2.0	0.00216	0.00012	0.00055	0.00002	30.355	0.229	130.8	1.0
1200	0.8283	31.519	0.303	0.00303	0.00017	0.00182	0.00006	1.7	0.00555	0.00032	0.00063	0.00004	30.953	0.302	133.3	1.3
1500	0.8595	30.074	0.139	0.00639	0.00058	0.00406	0.00043	4.0	0.01172	0.00106	0.00112	0.00011	28.845	0.185	124.5	0.8
1750	0.8705	28.904	0.154	0.00283	0.00192	0.00416	0.00085	4.3	0.00519	0.00353	0.00101	0.00030	27.648	0.293	119.5	1.2
2000	0.8788	29.014	0.188	0.00442	0.00283	0.00517	0.00199	5.3	0.00812	0.00520	0.00111	0.00044	27.459	0.616	118.7	2.6
2500	0.8876	31.415	0.189	0.00876	0.00205	-0.00012	0.00176	-0.1	0.01607	0.00376	0.00073	0.00044	31.422	0.553	135.3	2.3
3000	0.8995	33.318	0.198	0.00979	0.00226	0.00123	0.00161	1.1	0.01796	0.00415	0.00072	0.00027	32.926	0.516	141.5	2.1
4000	0.9497	31.320	0.161	0.00372	0.00047	0.00181	0.00039	1.7	0.00683	0.00086	0.00036	0.00008	30.757	0.196	132.5	0.8
8000	1.0000	29.498	0.125	0.00180	0.00053	0.00209	0.00035	2.1	0.00331	0.00098	0.00049	0.00007	28.851	0.161	124.6	0.7
Integrated		31.032	0.123	0.00247	0.00009	0.00384	0.00006	3.7	0.00453	0.00016	0.00065	0.00002	29.868	0.124	128.8	0.8

UAF110-19 03MBW390A WM#2 09-24A04 USGSGOLD

Weighted average of J from standards = 0.002478 +/- 0.000013

Laser (mW)	Cum. ³⁹ Ar	⁴⁰ Ar/ ³⁹ Ar measured	+/-	³⁷ Ar/ ³⁹ Ar measured	+/-	³⁶ Ar/ ³⁹ Ar measured	+/-	% Atm. ⁴⁰ Ar	Ca/K	+/-	Cl/K	+/-	⁴⁰ Ar*/ ³⁹ Ar _K	+/-	Age (Ma)	+/- (Ma)
150	0.0005	59.493	4.975	0.16175	0.12058	0.28302	0.06370	140.6	0.29682	0.22129	0.02624	0.01765	-24.158	17.598	-111.3	83.7
300	0.0017	43.335	1.822	0.10398	0.04712	0.16591	0.02477	113.2	0.19080	0.08647	0.00613	0.00655	-5.713	7.034	-25.7	31.9
450	0.0055	31.684	0.411	0.01899	0.01413	0.02556	0.00904	23.9	0.03484	0.02594	0.00499	0.00198	24.103	2.688	104.6	11.3
600	0.0139	34.042	0.269	0.00245	0.00658	0.02670	0.00383	23.2	0.00449	0.01207	0.00332	0.00093	26.124	1.151	113.1	4.8
750	0.0354	30.483	0.156	0.00309	0.00248	0.00885	0.00157	8.6	0.00566	0.00456	0.00153	0.00044	27.839	0.487	120.3	2.0
900	0.1464	28.349	0.108	0.00077	0.00041	0.00277	0.00038	2.9	0.00142	0.00076	0.00080	0.00006	27.503	0.156	118.9	0.7
1150	0.3381	28.310	0.113	-0.00008	0.00027	0.00181	0.00025	1.9	-0.00015	0.00050	0.00072	0.00005	27.746	0.133	119.9	0.6
1500	0.4956	28.670	0.115	0.00040	0.00037	0.00326	0.00029	3.4	0.00073	0.00067	0.00059	0.00005	27.679	0.141	119.7	0.6
2000	0.6124	28.258	0.112	0.00006	0.00038	0.00292	0.00035	3.1	0.00012	0.00069	0.00054	0.00004	27.367	0.152	118.4	0.6
2500	0.7529	35.907	0.138	0.00003	0.00052	0.00250	0.00023	2.1	0.00006	0.00095	0.00042	0.00007	35.140	0.153	150.6	0.6
3000	0.8352	38.368	0.152	0.00034	0.00064	0.00317	0.00047	2.4	0.00063	0.00118	0.00046	0.00009	37.403	0.205	159.9	0.8
4500	0.9327	35.979	0.141	0.00080	0.00070	0.00253	0.00027	2.1	0.00147	0.00128	0.00052	0.00008	35.203	0.160	150.9	0.7
8000	1.0000	28.390	0.129	0.00027	0.00097	0.00307	0.00038	3.2	0.00049	0.00179	0.00044	0.00012	27.454	0.170	118.7	0.7
Integrated		31.156	0.044	0.00064	0.00021	0.00343	0.00013	3.3	0.00117	0.00038	0.00066	0.00003	30.113	0.058	129.8	0.7

UAF110-19 03MBW390A WM#3 10-02D04 USGSGOLD

Weighted average of J from standards = 0.002478 +/- 0.000013

Laser (mW)	Cum. ³⁹ Ar	⁴⁰ Ar/ ³⁹ Ar measured	+/-	³⁷ Ar/ ³⁹ Ar measured	+/-	³⁶ Ar/ ³⁹ Ar measured	+/-	% Atm. ⁴⁰ Ar	Ca/K	+/-	Cl/K	+/-	⁴⁰ Ar*/ ³⁹ Ar _K	+/-	Age (Ma)	+/- (Ma)
200	0.0011	74.843	10.297	-0.22312	0.16927	0.38203	0.12029	150.9	-0.40934	0.31050	-0.00044	0.01935	-38.088	32.402	-178.8	159.9
400	0.0066	33.623	1.076	-0.01887	0.02066	0.02356	0.01029	20.7	-0.03463	0.03790	0.00581	0.00310	26.631	3.149	115.3	13.2
600	0.0228	36.967	0.398	-0.00526	0.00806	0.02848	0.00354	22.8	-0.00965	0.01479	0.00374	0.00108	28.521	1.089	123.2	4.6
800	0.1254	32.055	0.157	-0.00047	0.00125	0.00748	0.00063	6.9	-0.00085	0.00230	0.00139	0.00016	29.815	0.238	128.6	1.0
1000	0.6720	30.298	0.104	-0.00086	0.00032	0.00101	0.00018	1.0	-0.00158	0.00058	0.00065	0.00003	29.970	0.116	129.2	0.5
1300	0.8185	28.531	0.145	0.00130	0.00137	0.00176	0.00038	1.8	0.00238	0.00252	0.00111	0.00009	27.982	0.182	120.9	0.8
1600	0.8330	28.534	0.303	-0.00814	0.01257	0.00152	0.00428	1.6	-0.01493	0.02307	0.00009	0.00102	28.056	1.299	121.2	5.4
2000	0.8493	30.810	0.278	-0.00573	0.01022	0.00190	0.00421	1.8	-0.01051	0.01875	0.00014	0.00115	30.219	1.273	130.3	5.3
2500	0.8787	31.815	0.237	0.00482	0.00815	0.00026	0.00230	0.2	0.00885	0.01495	0.00056	0.00048	31.711	0.721	136.4	3.0
3000	0.9015	32.631	0.279	0.00042	0.00715	0.00689	0.00337	6.2	0.00077	0.01312	0.00100	0.00066	30.567	1.030	131.7	4.3
3400	0.9187	28.873	0.254	0.00097	0.00665	0.00728	0.00321	7.5	0.00178	0.01219	0.00127	0.00096	26.692	0.978	115.5	4.1
8000	1.0000	28.680	0.162	0.00365	0.00133	0.00235	0.00106	2.4	0.00670	0.00243	0.00104	0.00017	27.959	0.351	120.8	1.5
Integrated		30.317	0.066	-0.00050	0.00056	0.00311	0.00026	3.0	-0.00092	0.00103	0.00090	0.00006	29.370	0.100	126.7	0.8

UAF110-19 03MBW390A WM#4 10-03A04 USGSGOLD

Weighted average of J from standards = 0.002478 +/- 0.000013

Laser (mW)	Cum. ³⁹ Ar	⁴⁰ Ar/ ³⁹ Ar measured	+/-	³⁷ Ar/ ³⁹ Ar measured	+/-	³⁶ Ar/ ³⁹ Ar measured	+/-	% Atm. ⁴⁰ Ar	Ca/K	+/-	Cl/K	+/-	⁴⁰ Ar*/ ³⁹ Ar _K	+/-	Age (Ma)	+/- (Ma)
200	0.0012	99.948	14.614	0.43832	0.30216	0.34652	0.17347	102.4	0.80449	0.55474	0.04602	0.02445	-2.444	49.055	-11.0	220.6
400	0.0059	39.544	2.032	0.08038	0.06662	0.11249	0.02743	84.1	0.14749	0.12226	0.01845	0.00641	6.280	7.940	27.9	35.0
600	0.0635	32.553	0.221	0.01513	0.00521	0.01727	0.00301	15.7	0.02777	0.00955	0.00232	0.00048	27.424	0.909	118.6	3.8
800	0.7807	28.669	0.120	0.00079	0.00063	0.00521	0.00022	5.4	0.00145	0.00116	0.00061	0.00005	27.102	0.133	117.2	0.6
1000	0.8473	28.736	0.152	0.01026	0.00503	0.00545	0.00307	5.6	0.01882	0.00923	0.00128	0.00053	27.097	0.919	117.2	3.9
1300	0.8634	28.662	0.629	0.01105	0.01531	0.01483	0.00807	15.3	0.02028	0.02810	0.00374	0.00224	24.251	2.442	105.3	10.3
1600	0.8832	29.349	0.493	-0.02591	0.01498	0.00223	0.00757	2.3	-0.04755	0.02748	0.00129	0.00144	28.659	2.287	123.8	9.5
2000	0.9092	28.691	0.340	-0.00354	0.01181	0.00658	0.00486	6.8	-0.00649	0.02166	0.00088	0.00116	26.719	1.470	115.6	6.2
2500	0.9609	28.419	0.227	0.00249	0.00462	0.00552	0.00284	5.7	0.00457	0.00848	0.00004	0.00060	26.760	0.866	115.8	3.6
3000	0.9854	28.853	0.348	0.00258	0.01321	-0.00724	0.00752	-7.4	0.00474	0.02424	0.00073	0.00166	30.965	2.252	133.4	9.4
3400	0.9861	29.495	9.858	0.01517	0.33898	-0.16438	0.27762	-164.9	0.02783	0.62199	0.04225	0.04680	78.044	84.526	318.9	316.6
8000	1.0000	29.324	0.640	0.01722	0.01272	0.00509	0.01311	5.1	0.03160	0.02335	0.00202	0.00233	27.792	3.922	120.1	16.4
Integrated		29.047	0.092	0.00303	0.00106	0.00654	0.00057	6.7	0.00555	0.00194	0.00099	0.00011	27.085	0.191	117.2	1.0

UAF110-19 03MBW390A WM#5 10-03B04 USGSGOLD

Weighted average of J from standards = 0.002478 +/- 0.000013

Laser (mW)	Cum. ³⁹ Ar	⁴⁰ Ar/ ³⁹ Ar measured	+/-	³⁷ Ar/ ³⁹ Ar measured	+/-	³⁶ Ar/ ³⁹ Ar measured	+/-	% Atm. ⁴⁰ Ar	Ca/K	+/-	Cl/K	+/-	⁴⁰ Ar*/ ³⁹ Ar _K	+/-	Age (Ma)	+/- (Ma)
200	0.0007	53.828	9.592	0.60811	0.21622	0.46129	0.13438	253.3	1.11624	0.39706	0.03669	0.02770	-82.499	34.709	-412.5	195.0
400	0.0040	36.810	0.794	0.06925	0.04850	0.06224	0.01955	50.0	0.12706	0.08900	0.00330	0.00572	18.394	5.779	80.4	24.7
600	0.0166	31.811	0.230	0.01884	0.01525	0.01578	0.00478	14.7	0.03456	0.02799	0.00280	0.00167	27.120	1.426	117.3	6.0
800	0.3749	32.689	0.132	0.00026	0.00047	0.00219	0.00020	2.0	0.00049	0.00085	0.00046	0.00006	32.013	0.144	137.7	0.6
1000	0.8421	30.242	0.114	0.00059	0.00033	0.00088	0.00011	0.9	0.00108	0.00061	0.00040	0.00005	29.953	0.118	129.1	0.5
1300	0.8785	28.096	0.165	0.00233	0.00478	0.00441	0.00268	4.6	0.00428	0.00878	0.00033	0.00051	26.764	0.807	115.8	3.4
1600	0.8869	28.614	0.434	0.02465	0.01783	0.01154	0.00901	11.9	0.04523	0.03271	0.00089	0.00228	25.178	2.690	109.2	11.3
2000	0.8961	32.077	0.369	0.02077	0.01722	0.01442	0.00966	13.3	0.03812	0.03160	0.00047	0.00198	27.790	2.872	120.1	12.0
2500	0.9061	36.224	0.590	0.02252	0.01462	0.01596	0.00811	13.0	0.04133	0.02683	0.00019	0.00204	31.480	2.452	135.5	10.2
3000	0.9490	31.938	0.183	-0.00144	0.00309	0.00450	0.00122	4.2	-0.00265	0.00568	0.00031	0.00039	30.580	0.402	131.8	1.7
3400	0.9531	29.376	0.546	0.00077	0.03319	0.03191	0.01435	32.1	0.00141	0.06091	0.01016	0.00307	19.919	4.253	86.9	18.1
8000	1.0000	28.750	0.140	-0.00053	0.00261	0.00336	0.00180	3.5	-0.00098	0.00479	0.00066	0.00027	27.727	0.549	119.9	2.3

Integrated	31.161	0.073	0.00191	0.00053	0.00297	0.00025	2.8	0.00350	0.00098	0.00054	0.00007	30.255	0.104	130.4	0.8
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UAF110-19 03MBW390A WM#6 10-03C04 USGSGOLD

Weighted average of J from standards = 0.002478 +/- 0.000013

Laser (mW)	Cum. ³⁹ Ar	⁴⁰ Ar/ ³⁹ Ar measured	+/-	³⁷ Ar/ ³⁹ Ar measured	+/-	³⁶ Ar/ ³⁹ Ar measured	+/-	% Atm. ⁴⁰ Ar	Ca/K	+/-	Cl/K	+/-	⁴⁰ Ar*/ ³⁹ Ar _K	+/-	Age (Ma)	+/- (Ma)
200	0.0014	68.149	5.211	0.33859	0.11938	0.27682	0.04933	120.0	0.62140	0.21914	0.00850	0.01029	-13.657	13.224	-62.1	61.2
400	0.0070	36.172	0.505	0.06013	0.03874	0.05355	0.01721	43.8	0.11034	0.07109	0.00814	0.00347	20.323	5.089	88.6	21.7
600	0.0303	31.689	0.313	0.01187	0.00570	0.01687	0.00262	15.7	0.02178	0.01045	0.00374	0.00086	26.676	0.819	115.5	3.4
750	0.1219	31.260	0.141	0.00314	0.00144	0.01303	0.00083	12.3	0.00577	0.00265	0.00107	0.00018	27.382	0.279	118.4	1.2
900	0.4517	28.467	0.124	0.00176	0.00058	0.00400	0.00019	4.2	0.00323	0.00107	0.00068	0.00005	27.257	0.133	117.9	0.6
1100	0.7468	27.900	0.120	0.00354	0.00068	0.00389	0.00025	4.1	0.00650	0.00124	0.00074	0.00004	26.723	0.138	115.7	0.6
1400	0.8029	28.094	0.157	0.01729	0.00242	0.00542	0.00092	5.7	0.03172	0.00444	0.00077	0.00027	26.466	0.311	114.6	1.3
1700	0.8243	27.843	0.175	-0.00846	0.00415	0.00437	0.00299	4.6	-0.01552	0.00762	0.00101	0.00066	26.521	0.901	114.8	3.8
2000	0.8439	27.249	0.236	-0.00317	0.00517	0.00609	0.00329	6.6	-0.00582	0.00949	0.00061	0.00075	25.420	0.996	110.2	4.2
2500	0.8616	27.942	0.253	-0.00891	0.00666	0.00362	0.00340	3.8	-0.01636	0.01221	0.00140	0.00074	26.841	1.034	116.2	4.3
3500	0.8776	27.891	0.300	0.00254	0.00636	0.00161	0.00428	1.7	0.00466	0.01167	0.00198	0.00091	27.388	1.299	118.4	5.4
8000	1.0000	27.999	0.153	0.00200	0.00071	0.00280	0.00041	3.0	0.00366	0.00131	0.00045	0.00014	27.142	0.193	117.4	0.8
Integrated		28.594	0.061	0.00384	0.00050	0.00568	0.00023	5.9	0.00705	0.00092	0.00087	0.00006	26.888	0.090	116.3	0.7

UAF110-19 03MBW390A WM#7 10-03D04 USGSGOLD

Weighted average of J from standards = 0.002478 +/- 0.000013

Laser (mW)	Cum. ³⁹ Ar	⁴⁰ Ar/ ³⁹ Ar measured	+/-	³⁷ Ar/ ³⁹ Ar measured	+/-	³⁶ Ar/ ³⁹ Ar measured	+/-	% Atm. ⁴⁰ Ar	Ca/K	+/-	Cl/K	+/-	⁴⁰ Ar*/ ³⁹ Ar _K	+/-	Age (Ma)	+/- (Ma)
200	0.0016	38.868	4.815	0.18183	0.13598	0.21375	0.07771	162.6	0.33367	0.24956	0.02265	0.01800	-24.314	21.811	-112.1	103.7
400	0.0118	31.720	0.657	-0.05001	0.02711	-0.00615	0.01108	-5.7	-0.09175	0.04974	-0.00078	0.00241	33.504	3.348	143.9	13.8
600	0.0451	32.741	0.410	-0.00058	0.00917	0.01333	0.00406	12.0	-0.00107	0.01683	0.00100	0.00056	28.774	1.253	124.2	5.2
750	0.3429	34.772	0.155	0.00217	0.00095	0.00314	0.00056	2.7	0.00399	0.00174	0.00052	0.00008	33.816	0.225	145.2	0.9
900	0.6353	33.795	0.182	0.00663	0.00109	0.00399	0.00050	3.5	0.01217	0.00200	0.00073	0.00009	32.588	0.231	140.1	1.0
1100	0.7688	31.212	0.153	0.01852	0.00137	0.00380	0.00164	3.6	0.03399	0.00251	0.00073	0.00027	30.061	0.507	129.6	2.1
1400	0.8163	28.976	0.217	0.12474	0.00509	0.00785	0.00301	8.0	0.22890	0.00934	0.00170	0.00068	26.640	0.912	115.3	3.8
1700	0.8623	30.674	0.194	0.01437	0.00603	0.00855	0.00276	8.2	0.02637	0.01107	0.00085	0.00104	28.121	0.835	121.5	3.5
2000	0.8938	30.304	0.344	0.02777	0.00899	0.00671	0.00378	6.5	0.05096	0.01650	0.00141	0.00104	28.295	1.164	122.2	4.9
2500	0.9233	34.969	0.393	0.04554	0.00857	0.00950	0.00532	8.0	0.08356	0.01572	0.00239	0.00110	32.139	1.613	138.2	6.7
3500	0.9658	35.074	0.281	0.01765	0.00570	0.00771	0.00309	6.5	0.03239	0.01046	0.00054	0.00064	32.767	0.950	140.8	3.9

8000	1.0000	31.309	0.286	0.04034	0.00631	0.01003	0.00371	9.5	0.07401	0.01158	0.00055	0.00085	28.321	1.128	122.3	4.7
Integrated		33.215	0.079	0.01577	0.00090	0.00527	0.00050	4.7	0.02893	0.00166	0.00080	0.00011	31.630	0.167	136.1	1.0

UAF110-19 03MBW390A WM#8 10-04A04 USGSGOLD

Weighted average of J from standards = 0.002478 +/- 0.000013

Laser (mW)	Cum. ³⁹ Ar	⁴⁰ Ar/ ³⁹ Ar measured	+/-	³⁷ Ar/ ³⁹ Ar measured	+/-	³⁶ Ar/ ³⁹ Ar measured	+/-	% Atm. ⁴⁰ Ar	Ca/K	+/-	Cl/K	+/-	⁴⁰ Ar*/ ³⁹ Ar _K	+/-	Age (Ma)	+/- (Ma)
200	0.0008	82.760	10.494	0.40359	0.19763	0.57573	0.14863	205.6	0.74072	0.36281	0.02344	0.02106	-87.390	39.847	-440.2	227.3
400	0.0044	35.518	1.192	0.12580	0.05089	0.06520	0.02151	54.3	0.23085	0.09339	0.00922	0.00464	16.232	6.348	71.1	27.3
600	0.0259	38.856	0.315	0.00559	0.00722	0.03812	0.00437	29.0	0.01027	0.01324	0.00385	0.00094	27.562	1.312	119.2	5.5
750	0.2213	29.434	0.125	0.00164	0.00077	0.00378	0.00037	3.8	0.00300	0.00141	0.00093	0.00009	28.288	0.164	122.2	0.7
900	0.6657	28.981	0.128	-0.00003	0.00035	0.00122	0.00018	1.2	-0.00006	0.00065	0.00062	0.00005	28.592	0.137	123.5	0.6
1100	0.8533	27.874	0.132	0.00105	0.00075	0.00219	0.00048	2.3	0.00192	0.00138	0.00084	0.00009	27.198	0.193	117.7	0.8
1400	0.8669	28.535	0.354	0.02025	0.01278	0.00972	0.00478	10.1	0.03715	0.02344	0.00214	0.00105	25.635	1.448	111.1	6.1
1700	0.8765	28.320	0.331	0.01834	0.01764	0.01131	0.00845	11.8	0.03365	0.03237	0.00325	0.00166	24.950	2.514	108.2	10.6
2000	0.8862	31.808	0.457	0.02296	0.01631	0.01062	0.00811	9.9	0.04214	0.02993	0.00265	0.00179	28.644	2.430	123.7	10.1
2500	0.8998	33.899	0.560	0.02052	0.01194	0.00739	0.00562	6.4	0.03765	0.02190	0.00068	0.00127	31.690	1.740	136.4	7.2
3500	0.9694	28.810	0.162	0.00288	0.00237	0.00470	0.00087	4.8	0.00529	0.00435	0.00059	0.00024	27.394	0.300	118.5	1.3
8000	1.0000	27.960	0.185	0.01369	0.00562	0.00886	0.00233	9.4	0.02512	0.01031	0.00058	0.00054	25.315	0.708	109.7	3.0
Integrated		29.179	0.069	0.00296	0.00056	0.00424	0.00028	4.3	0.00544	0.00103	0.00090	0.00006	27.898	0.106	120.6	0.8

UAF110-19 03MBW390A WM#9 10-04B04 USGSGOLD

Weighted average of J from standards = 0.002478 +/- 0.000013

Laser (mW)	Cum. ³⁹ Ar	⁴⁰ Ar/ ³⁹ Ar measured	+/-	³⁷ Ar/ ³⁹ Ar measured	+/-	³⁶ Ar/ ³⁹ Ar measured	+/-	% Atm. ⁴⁰ Ar	Ca/K	+/-	Cl/K	+/-	⁴⁰ Ar*/ ³⁹ Ar _K	+/-	Age (Ma)	+/- (Ma)
200	0.0010	40.032	4.972	0.05355	0.15164	0.22061	0.05979	163.0	0.09827	0.27825	0.03164	0.01282	-25.185	16.026	-116.2	76.4
400	0.0050	33.365	0.728	0.03703	0.04647	0.04746	0.01725	42.1	0.06795	0.08527	0.01249	0.00324	19.316	5.107	84.3	21.8
600	0.0167	32.109	0.376	0.01785	0.01227	0.01943	0.00555	17.9	0.03276	0.02252	0.00564	0.00145	26.340	1.668	114.1	7.0
750	0.1298	29.370	0.140	0.00264	0.00132	0.00320	0.00064	3.2	0.00485	0.00241	0.00098	0.00014	28.396	0.233	122.7	1.0
900	0.5816	29.600	0.123	0.00068	0.00038	0.00116	0.00013	1.2	0.00125	0.00069	0.00055	0.00004	29.227	0.128	126.1	0.5
1100	0.8096	28.632	0.138	0.00082	0.00082	0.00303	0.00034	3.1	0.00150	0.00151	0.00081	0.00009	27.709	0.169	119.8	0.7
1400	0.8910	28.575	0.135	-0.00002	0.00173	0.00250	0.00080	2.6	-0.00003	0.00318	0.00062	0.00015	27.806	0.270	120.2	1.1
1700	0.8981	28.042	0.468	0.01573	0.02782	0.00651	0.00803	6.9	0.02886	0.05104	0.00165	0.00196	26.092	2.413	113.0	10.1
2000	0.9049	28.678	0.557	0.02062	0.02353	0.00180	0.00976	1.8	0.03783	0.04318	0.00375	0.00272	28.121	2.935	121.5	12.3
2500	0.9100	28.496	0.668	0.02999	0.03146	-0.00752	0.01260	-7.8	0.05504	0.05773	0.00273	0.00406	30.693	3.791	132.2	15.8

3500	0.9191	29.563	0.445	-0.02113	0.01912	-0.01567	0.00984	-15.7	-0.03878	0.03508	0.00077	0.00203	34.161	2.951	146.6	12.2
8000	1.0000	29.324	0.152	0.00135	0.00197	0.00174	0.00102	1.8	0.00248	0.00362	0.00067	0.00019	28.781	0.336	124.3	1.4
Integrated		29.279	0.068	0.00152	0.00057	0.00243	0.00024	2.5	0.00279	0.00105	0.00085	0.00006	28.531	0.098	123.2	0.7

UAF110-19 03MBW390A WM#10 10-04C04 USGSGOLD

Weighted average of J from standards = 0.002478 +/- 0.000013

Laser (mW)	Cum. ³⁹ Ar	⁴⁰ Ar/ ³⁹ Ar measured	+/-	³⁷ Ar/ ³⁹ Ar measured	+/-	³⁶ Ar/ ³⁹ Ar measured	+/-	% Atm. ⁴⁰ Ar	Ca/K	+/-	Cl/K	+/-	⁴⁰ Ar*/ ³⁹ Ar _K	+/-	Age (Ma)	+/- (Ma)
200	0.0024	90.763	6.150	0.13848	0.13218	0.41301	0.07245	134.5	0.25411	0.24258	0.00330	0.01771	-31.302	19.870	-145.6	96.3
400	0.0145	38.785	0.843	0.12870	0.02581	0.06192	0.01269	47.2	0.23617	0.04736	0.00458	0.00256	20.471	3.760	89.3	16.0
600	0.0664	48.315	0.227	0.06782	0.00586	0.07630	0.00299	46.7	0.12445	0.01076	0.00158	0.00069	25.745	0.894	111.6	3.8
700	0.4329	32.425	0.175	0.00695	0.00085	0.01217	0.00051	11.1	0.01276	0.00156	0.00062	0.00008	28.800	0.220	124.3	0.9
800	0.6755	30.207	0.161	0.00668	0.00121	0.00963	0.00063	9.4	0.01225	0.00221	0.00063	0.00013	27.333	0.239	118.2	1.0
900	0.7201	30.193	0.192	0.03551	0.00629	0.01869	0.00376	18.3	0.06516	0.01154	0.00131	0.00089	24.644	1.122	106.9	4.7
1000	0.7417	30.836	0.462	0.12052	0.01385	0.02498	0.00525	23.9	0.22115	0.02542	0.00334	0.00138	23.438	1.588	101.8	6.7
1200	0.7839	31.089	0.258	0.13736	0.00882	0.01826	0.00344	17.3	0.25206	0.01618	0.00220	0.00088	25.677	1.040	111.3	4.4
1500	0.8511	29.507	0.181	0.44490	0.00632	0.01159	0.00204	11.5	0.81656	0.01159	0.00239	0.00054	26.096	0.625	113.0	2.6
2000	0.8932	28.208	0.260	1.34854	0.01858	0.01129	0.00271	11.5	2.47656	0.03416	0.00259	0.00071	24.965	0.835	108.3	3.5
2500	0.9128	29.057	0.507	0.19330	0.01716	0.01782	0.00607	18.1	0.35473	0.03149	0.00323	0.00188	23.779	1.839	103.3	7.8
3500	0.9549	33.933	0.338	0.54400	0.01216	0.01213	0.00309	10.5	0.99852	0.02233	0.00404	0.00088	30.371	0.962	130.9	4.0
8000	1.0000	34.943	0.349	0.21106	0.00808	0.01520	0.00222	12.8	0.38732	0.01482	0.00249	0.00088	30.442	0.725	131.2	3.0
Integrated		32.473	0.085	0.14247	0.00136	0.01743	0.00052	15.8	0.26143	0.00250	0.00136	0.00013	27.308	0.170	118.1	0.9

UAF110-19 03MBW390A WM#11 10-05A04 USGSGOLD

Weighted average of J from standards = 0.002478 +/- 0.000013

Laser (mW)	Cum. ³⁹ Ar	⁴⁰ Ar/ ³⁹ Ar measured	+/-	³⁷ Ar/ ³⁹ Ar measured	+/-	³⁶ Ar/ ³⁹ Ar measured	+/-	% Atm. ⁴⁰ Ar	Ca/K	+/-	Cl/K	+/-	⁴⁰ Ar*/ ³⁹ Ar _K	+/-	Age (Ma)	+/- (Ma)
200	0.0009	134.382	11.172	0.25642	0.13411	0.59950	0.07680	131.8	0.47058	0.24615	0.02604	0.01267	-42.788	17.658	-202.2	88.3
400	0.0039	31.309	0.887	0.03014	0.02999	0.06399	0.01315	60.4	0.05531	0.05503	0.00764	0.00328	12.375	3.868	54.5	16.8
600	0.0150	33.678	0.343	0.01210	0.00844	0.02865	0.00525	25.2	0.02221	0.01548	0.00260	0.00137	25.184	1.573	109.2	6.6
700	0.0334	32.270	0.187	0.00322	0.00480	0.01810	0.00219	16.6	0.00591	0.00880	0.00095	0.00083	26.892	0.668	116.4	2.8
800	0.1705	28.985	0.126	0.00265	0.00100	0.00512	0.00042	5.2	0.00487	0.00183	0.00081	0.00011	27.443	0.173	118.7	0.7
900	0.4999	29.232	0.108	0.00005	0.00034	0.00134	0.00017	1.4	0.00009	0.00063	0.00043	0.00004	28.808	0.118	124.4	0.5
1000	0.6183	29.156	0.128	0.00231	0.00111	0.00234	0.00041	2.4	0.00423	0.00203	0.00074	0.00009	28.437	0.174	122.8	0.7
1200	0.7826	29.158	0.137	0.00187	0.00060	0.00177	0.00026	1.8	0.00343	0.00110	0.00073	0.00007	28.607	0.155	123.5	0.7

1500	0.8227	28.373	0.140	0.00985	0.00274	0.00541	0.00110	5.6	0.01807	0.00502	0.00125	0.00033	26.746	0.351	115.8	1.5
2000	0.8369	28.665	0.208	0.01346	0.00678	0.00389	0.00425	4.0	0.02470	0.01245	0.00185	0.00078	27.487	1.272	118.9	5.3
2500	0.8455	28.793	0.416	0.03242	0.01065	0.00568	0.00398	5.8	0.05949	0.01954	0.00118	0.00121	27.089	1.240	117.2	5.2
3500	0.8819	29.324	0.164	0.02405	0.00338	0.00472	0.00127	4.8	0.04413	0.00619	0.00077	0.00029	27.904	0.408	120.6	1.7
8000	1.0000	29.079	0.179	0.01733	0.00104	0.00234	0.00040	2.4	0.03180	0.00192	0.00055	0.00010	28.362	0.212	122.5	0.9
Integrated		29.320	0.054	0.00526	0.00040	0.00385	0.00018	3.9	0.00965	0.00073	0.00073	0.00004	28.154	0.074	121.6	0.7

UAF110-19 03MBW390A WM#12 10-04C04 USGSGOLD

Weighted average of J from standards = 0.002478 +/- 0.000013

Laser (mW)	Cum. ³⁹ Ar	⁴⁰ Ar/ ³⁹ Ar measured	+/-	³⁷ Ar/ ³⁹ Ar measured	+/-	³⁶ Ar/ ³⁹ Ar measured	+/-	% Atm. ⁴⁰ Ar	Ca/K	+/-	Cl/K	+/-	⁴⁰ Ar*/ ³⁹ Ar _K	+/-	Age (Ma)	+/- (Ma)
200	0.0013	50.996	3.232	0.36864	0.07416	0.34075	0.03623	197.5	0.67657	0.13614	0.02109	0.00818	-49.709	9.167	-237.1	46.7
400	0.0077	34.637	0.660	0.01082	0.01265	0.02991	0.00952	25.5	0.01985	0.02321	0.00432	0.00188	25.771	2.852	111.7	12.0
600	0.0400	33.944	0.228	0.00316	0.00316	0.00875	0.00176	7.6	0.00580	0.00580	0.00186	0.00050	31.331	0.564	134.9	2.3
700	0.1890	35.704	0.146	0.00237	0.00080	0.00377	0.00036	3.1	0.00434	0.00147	0.00063	0.00010	34.560	0.179	148.2	0.7
800	0.4584	29.911	0.104	0.00118	0.00037	0.00345	0.00028	3.4	0.00216	0.00069	0.00061	0.00007	28.861	0.132	124.6	0.6
900	0.6272	31.432	0.110	0.00085	0.00055	0.00228	0.00040	2.1	0.00156	0.00100	0.00057	0.00008	30.728	0.162	132.4	0.7
1000	0.7209	30.600	0.158	0.00520	0.00124	0.00311	0.00063	3.0	0.00954	0.00228	0.00071	0.00018	29.654	0.242	127.9	1.0
1200	0.8336	30.892	0.130	0.00203	0.00116	0.00240	0.00067	2.3	0.00373	0.00213	0.00059	0.00008	30.154	0.236	130.0	1.0
1500	0.8631	29.893	0.153	0.00328	0.00461	0.00103	0.00231	1.0	0.00602	0.00845	0.00111	0.00043	29.560	0.699	127.5	2.9
2000	0.8831	30.483	0.279	0.01541	0.00650	0.00721	0.00330	7.0	0.02827	0.01193	0.00122	0.00065	28.324	1.008	122.4	4.2
2500	0.9128	33.424	0.225	0.00366	0.00562	0.00166	0.00247	1.5	0.00671	0.01031	0.00085	0.00043	32.906	0.763	141.4	3.2
3500	0.9737	30.953	0.110	0.00151	0.00205	0.00377	0.00132	3.6	0.00277	0.00375	0.00055	0.00017	29.811	0.406	128.6	1.7
8000	1.0000	29.894	0.139	-0.00300	0.00588	-0.00135	0.00286	-1.3	-0.00551	0.01078	0.00081	0.00050	30.265	0.855	130.4	3.6
Integrated		31.572	0.048	0.00271	0.00044	0.00378	0.00024	3.5	0.00497	0.00080	0.00074	0.00005	30.427	0.085	131.1	0.7

UAF110-19 03MBW390A WM#13 10-05C04 USGSGOLD

Weighted average of J from standards = 0.002478 +/- 0.000013

Laser (mW)	Cum. ³⁹ Ar	⁴⁰ Ar/ ³⁹ Ar measured	+/-	³⁷ Ar/ ³⁹ Ar measured	+/-	³⁶ Ar/ ³⁹ Ar measured	+/-	% Atm. ⁴⁰ Ar	Ca/K	+/-	Cl/K	+/-	⁴⁰ Ar*/ ³⁹ Ar _K	+/-	Age (Ma)	+/- (Ma)
200	0.0011	57.413	1.363	0.19932	0.04227	0.28808	0.02041	148.3	0.36577	0.07758	0.01971	0.00458	-27.733	5.730	-128.4	27.5
400	0.0044	39.046	0.628	0.07977	0.02060	0.08553	0.00778	64.8	0.14637	0.03780	0.00718	0.00181	13.750	2.277	60.4	9.8
600	0.0147	37.798	0.238	0.03420	0.00618	0.03120	0.00250	24.4	0.06275	0.01134	0.00879	0.00049	28.553	0.762	123.3	3.2
700	0.0304	35.808	0.213	0.01459	0.00296	0.02638	0.00204	21.8	0.02678	0.00543	0.00484	0.00030	27.987	0.627	120.9	2.6
800	0.0814	32.335	0.123	0.00511	0.00092	0.01021	0.00054	9.3	0.00938	0.00168	0.00297	0.00013	29.289	0.198	126.4	0.8

900	0.2298	31.624	0.128	0.00120	0.00035	0.00363	0.00017	3.4	0.00219	0.00065	0.00112	0.00005	30.524	0.136	131.5	0.6
1000	0.3619	31.636	0.125	0.00126	0.00042	0.00332	0.00023	3.1	0.00230	0.00078	0.00124	0.00006	30.625	0.140	131.9	0.6
1200	0.5967	32.362	0.321	0.00204	0.00017	0.00238	0.00017	2.2	0.00375	0.00031	0.00101	0.00003	31.631	0.324	136.1	1.3
1500	0.7974	31.100	0.100	0.00562	0.00028	0.00245	0.00016	2.3	0.01031	0.00051	0.00074	0.00003	30.347	0.110	130.8	0.5
2000	0.8495	29.829	0.122	0.01610	0.00088	0.00363	0.00057	3.6	0.02953	0.00162	0.00146	0.00012	28.730	0.207	124.1	0.9
2500	0.8638	29.666	0.145	0.01578	0.00266	0.00551	0.00187	5.5	0.02895	0.00488	0.00067	0.00040	28.011	0.571	121.1	2.4
3500	0.9090	30.592	0.102	0.00866	0.00070	0.00312	0.00058	3.0	0.01589	0.00128	0.00079	0.00019	29.643	0.199	127.9	0.8
8000	1.0000	31.574	0.132	0.00974	0.00069	0.00209	0.00031	2.0	0.01787	0.00127	0.00058	0.00007	30.928	0.159	133.2	0.7
Integrated		31.740	0.084	0.00562	0.00018	0.00448	0.00010	4.2	0.01031	0.00034	0.00125	0.00002	30.387	0.089	131.0	0.8

UAF110-19 03MBW390A WM#14 10-05D04 USGSGOLD

Weighted average of J from standards = 0.002478 +/- 0.000013

Laser (mW)	Cum. ³⁹ Ar	⁴⁰ Ar/ ³⁹ Ar measured	+/-	³⁷ Ar/ ³⁹ Ar measured	+/-	³⁶ Ar/ ³⁹ Ar measured	+/-	% Atm. ⁴⁰ Ar	Ca/K	+/-	Cl/K	+/-	⁴⁰ Ar*/ ³⁹ Ar _K	+/-	Age (Ma)	+/- (Ma)
200	0.0054	61.760	16.182	0.33631	0.47533	0.48065	0.28131	230.0	0.61722	0.87254	0.02163	0.03681	-80.294	77.293	-400.2	431.3
400	0.0319	28.593	1.806	0.31935	0.10725	0.07482	0.04695	77.3	0.58608	0.19688	0.01020	0.00896	6.481	13.815	28.7	60.8
600	0.0929	29.064	0.672	0.20066	0.04457	0.04119	0.01886	41.9	0.36823	0.08180	0.00832	0.00365	16.880	5.580	73.9	23.9
700	0.1361	31.141	0.915	0.13055	0.05307	0.03237	0.02797	30.7	0.23957	0.09739	0.00635	0.00542	21.559	8.286	93.9	35.2
800	0.1971	31.399	1.134	0.12222	0.04109	0.04276	0.01611	40.2	0.22427	0.07541	0.00249	0.00456	18.746	4.789	81.9	20.5
900	0.3311	31.565	0.460	0.10313	0.01723	0.01453	0.00687	13.6	0.18925	0.03162	0.00236	0.00203	27.252	2.070	117.9	8.7
1000	0.4740	31.771	0.427	0.24786	0.01875	-0.00185	0.01099	-1.8	0.45487	0.03441	0.00272	0.00175	32.312	3.278	138.9	13.6
1200	0.7047	32.420	0.335	0.90721	0.01401	0.01321	0.00638	11.8	1.66558	0.02574	0.00485	0.00095	28.573	1.910	123.4	8.0
1500	0.8346	30.568	0.567	2.87530	0.05788	0.01020	0.00997	9.2	5.28568	0.10660	0.00439	0.00223	27.794	2.997	120.1	12.5
2000	0.9018	30.227	0.960	0.80725	0.04690	0.01777	0.01843	17.2	1.48197	0.08615	0.00502	0.00307	25.021	5.504	108.5	23.2
2500	0.9276	39.821	2.752	4.86381	0.35152	0.03429	0.05301	24.5	8.95278	0.64910	0.01776	0.00854	30.119	15.837	129.8	65.9
3500	0.9861	37.747	1.684	0.54289	0.05072	0.00115	0.02242	0.8	0.99648	0.09313	0.00589	0.00358	37.432	6.834	160.0	28.0
8000	1.0000	106.666	16.654	2.71119	0.47108	-0.02374	0.10699	-6.8	4.98345	0.86742	0.06590	0.01978	114.057	36.336	449.0	126.6
Integrated		33.097	0.238	0.91770	0.01153	0.01895	0.00465	16.7	1.68486	0.02118	0.00577	0.00086	27.554	1.388	119.1	5.8

UAF110-25 EF88-42 WM#1 09-23A04 USGSGOLD

Weighted average of J from standards = 0.002478 +/- 0.000013

Laser (mW)	Cum. ³⁹ Ar	⁴⁰ Ar/ ³⁹ Ar measured	+/-	³⁷ Ar/ ³⁹ Ar measured	+/-	³⁶ Ar/ ³⁹ Ar measured	+/-	% Atm. ⁴⁰ Ar	Ca/K	+/-	Cl/K	+/-	⁴⁰ Ar*/ ³⁹ Ar _K	+/-	Age (Ma)	+/- (Ma)
150	0.0018	34.958	0.772	0.13869	0.02019	0.11006	0.01511	93.1	0.25450	0.03704	0.01617	0.00263	2.416	4.419	10.8	19.6
300	0.0079	28.282	0.399	0.09957	0.00559	0.03463	0.00290	36.2	0.18270	0.01025	0.00375	0.00068	18.028	0.897	78.8	3.8

450	0.0239	25.637	0.258	0.08988	0.00276	0.01125	0.00131	13.0	0.16492	0.00506	0.00150	0.00029	22.292	0.449	97.0	1.9
600	0.0549	26.895	0.140	0.10467	0.00165	0.00696	0.00066	7.6	0.19207	0.00302	0.00091	0.00015	24.821	0.236	107.7	1.0
750	0.1063	28.529	0.137	0.13168	0.00126	0.00509	0.00049	5.2	0.24164	0.00232	0.00086	0.00010	27.009	0.196	116.9	0.8
900	0.1808	29.615	0.125	0.02701	0.00057	0.00333	0.00045	3.3	0.04956	0.00105	0.00053	0.00007	28.604	0.181	123.5	0.8
1150	0.3083	28.429	0.132	0.00575	0.00024	0.00250	0.00021	2.6	0.01055	0.00044	0.00049	0.00005	27.662	0.143	119.6	0.6
1500	0.4623	28.263	0.106	0.00538	0.00021	0.00213	0.00019	2.2	0.00988	0.00038	0.00046	0.00003	27.605	0.119	119.4	0.5
2000	0.6472	28.208	0.081	0.00699	0.00025	0.00215	0.00018	2.3	0.01282	0.00046	0.00039	0.00003	27.545	0.096	119.1	0.4
2500	0.7808	28.138	0.095	0.01299	0.00035	0.00237	0.00021	2.5	0.02384	0.00064	0.00045	0.00006	27.410	0.112	118.5	0.5
3000	0.8682	27.902	0.124	0.01252	0.00057	0.00283	0.00032	3.0	0.02298	0.00105	0.00043	0.00008	27.040	0.154	117.0	0.6
4500	0.9742	28.030	0.108	0.03521	0.00065	0.00331	0.00027	3.5	0.06461	0.00120	0.00043	0.00006	27.026	0.133	116.9	0.6
8000	1.0000	29.323	0.125	0.04964	0.00174	0.00652	0.00118	6.6	0.09109	0.00319	0.00027	0.00020	27.373	0.370	118.4	1.6
Integrated		28.271	0.037	0.02502	0.00017	0.00344	0.00010	3.6	0.04591	0.00031	0.00054	0.00002	27.227	0.047	117.8	0.6

UAF110-25 EF88-42 WM#2 09-28A04 USGSGOLD

Weighted average of J from standards = 0.002478 +/- 0.000013

Laser (mW)	Cum. ³⁹ Ar	⁴⁰ Ar/ ³⁹ Ar measured	+/-	³⁷ Ar/ ³⁹ Ar measured	+/-	³⁶ Ar/ ³⁹ Ar measured	+/-	% Atm. ⁴⁰ Ar	Ca/K	+/-	Cl/K	+/-	⁴⁰ Ar*/ ³⁹ Ar _K	+/-	Age (Ma)	+/- (Ma)
150	0.0028	35.047	0.894	0.15037	0.02158	0.09909	0.01341	83.6	0.27593	0.03961	0.00989	0.00303	5.747	3.904	25.5	17.2
300	0.0130	26.981	0.244	0.13190	0.00784	0.02477	0.00409	27.1	0.24204	0.01438	0.00272	0.00077	19.645	1.223	85.7	5.2
450	0.0401	25.475	0.140	0.12965	0.00436	0.00912	0.00134	10.5	0.23791	0.00800	0.00135	0.00033	22.765	0.415	99.0	1.8
600	0.0902	26.505	0.144	0.05863	0.00199	0.00500	0.00105	5.6	0.10758	0.00366	0.00074	0.00015	25.005	0.341	108.4	1.4
750	0.1657	27.261	0.127	0.02351	0.00108	0.00407	0.00047	4.4	0.04314	0.00199	0.00059	0.00016	26.033	0.187	112.8	0.8
900	0.2656	28.094	0.111	0.00882	0.00100	0.00407	0.00043	4.3	0.01618	0.00184	0.00047	0.00009	26.862	0.167	116.2	0.7
1150	0.4082	28.266	0.114	0.01082	0.00065	0.00326	0.00028	3.4	0.01985	0.00119	0.00042	0.00006	27.274	0.139	118.0	0.6
1500	0.5605	28.234	0.111	0.00949	0.00059	0.00348	0.00035	3.6	0.01741	0.00109	0.00040	0.00007	27.177	0.149	117.6	0.6
2000	0.7282	27.886	0.121	0.01006	0.00059	0.00286	0.00034	3.0	0.01845	0.00108	0.00043	0.00006	27.014	0.155	116.9	0.7
2500	0.8225	27.693	0.142	0.02181	0.00079	0.00221	0.00051	2.4	0.04001	0.00146	0.00039	0.00011	27.012	0.205	116.9	0.9
3000	0.9003	27.705	0.130	0.02992	0.00154	0.00209	0.00040	2.2	0.05490	0.00282	0.00064	0.00013	27.063	0.174	117.1	0.7
4500	0.9635	28.671	0.110	0.07016	0.00162	0.00241	0.00051	2.5	0.12874	0.00297	0.00052	0.00021	27.936	0.187	120.7	0.8
8000	1.0000	29.692	0.143	0.15902	0.00310	0.00325	0.00114	3.2	0.29180	0.00569	0.00065	0.00022	28.716	0.365	124.0	1.5
Integrated		27.926	0.040	0.03017	0.00035	0.00386	0.00015	4.1	0.05536	0.00064	0.00056	0.00004	26.760	0.060	115.8	0.6

UAF110-25 EF88-42 WM#3 10-01A04 USGSGOLD

Weighted average of J from standards = 0.002478 +/- 0.000013

Laser	Cum.	⁴⁰ Ar/ ³⁹ Ar	+/-	³⁷ Ar/ ³⁹ Ar	+/-	³⁶ Ar/ ³⁹ Ar	+/-	% Atm.	Ca/K	+/-	Cl/K	+/-	⁴⁰ Ar*/ ³⁹ Ar _K	+/-	Age	+/-
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(mW)	³⁹ Ar	measured		measured		measured		⁴⁰ Ar							(Ma)	(Ma)
150	0.0022	35.136	0.665	0.08009	0.02958	0.07385	0.01518	62.1	0.14697	0.05427	0.00849	0.00313	13.292	4.478	58.5	19.4
300	0.0109	27.064	0.211	0.08619	0.00899	0.02059	0.00377	22.5	0.15816	0.01650	0.00200	0.00093	20.959	1.129	91.3	4.8
450	0.0370	26.266	0.129	0.06543	0.00299	0.01213	0.00095	13.6	0.12006	0.00549	0.00092	0.00033	22.659	0.307	98.5	1.3
600	0.0889	27.372	0.153	0.09626	0.00143	0.00554	0.00061	6.0	0.17663	0.00262	0.00056	0.00016	25.714	0.233	111.4	1.0
750	0.1781	28.477	0.150	0.10321	0.00108	0.00396	0.00032	4.1	0.18938	0.00198	0.00062	0.00009	27.287	0.173	118.0	0.7
900	0.2985	28.451	0.119	0.00994	0.00076	0.00304	0.00027	3.2	0.01824	0.00139	0.00051	0.00008	27.524	0.143	119.0	0.6
1150	0.4794	30.304	0.125	0.00752	0.00037	0.00314	0.00014	3.1	0.01379	0.00068	0.00040	0.00005	29.347	0.130	126.6	0.5
1500	0.6459	29.149	0.145	0.01111	0.00048	0.00289	0.00014	2.9	0.02039	0.00088	0.00047	0.00006	28.269	0.149	122.1	0.6
2000	0.7909	27.903	0.125	0.01609	0.00046	0.00286	0.00025	3.0	0.02952	0.00084	0.00048	0.00005	27.032	0.143	117.0	0.6
2500	0.8831	28.963	0.140	0.03015	0.00080	0.00327	0.00035	3.3	0.05532	0.00147	0.00045	0.00010	27.972	0.171	120.9	0.7
3000	0.9365	28.192	0.130	0.04575	0.00109	0.00402	0.00046	4.2	0.08394	0.00200	0.00077	0.00016	26.979	0.187	116.7	0.8
4500	0.9745	29.951	0.141	0.18329	0.00278	0.00885	0.00080	8.7	0.33636	0.00510	0.00084	0.00019	27.324	0.274	118.2	1.1
8000	1.0000	31.205	0.214	0.20546	0.00259	0.00976	0.00142	9.2	0.37705	0.00476	0.00110	0.00042	28.310	0.467	122.3	2.0
Integrated		28.875	0.046	0.04101	0.00028	0.00423	0.00011	4.3	0.07526	0.00051	0.00057	0.00003	27.601	0.056	119.3	0.6

UAF110-25 EF88-42 WM#4 10-01B04 USGSGOLD

Weighted average of J from standards = 0.002478 +/- 0.000013

Laser	Cum.	⁴⁰ Ar/ ³⁹ Ar	+/-	³⁷ Ar/ ³⁹ Ar	+/-	³⁶ Ar/ ³⁹ Ar	+/-	% Atm.	Ca/K	+/-	Cl/K	+/-	⁴⁰ Ar*/ ³⁹ Ar _K	+/-	Age	+/-
(mW)	³⁹ Ar	measured		measured		measured		⁴⁰ Ar							(Ma)	(Ma)
150	0.0028	40.256	0.827	0.08997	0.02547	0.12076	0.01060	88.7	0.16509	0.04675	0.00456	0.00235	4.549	3.058	20.2	13.5
300	0.0118	27.536	0.241	0.14866	0.00789	0.03165	0.00344	34.0	0.27279	0.01448	0.00252	0.00083	18.167	1.032	79.4	4.4
450	0.0388	27.577	0.189	0.97739	0.00916	0.01458	0.00086	15.4	1.79451	0.01682	0.00048	0.00029	23.328	0.304	101.4	1.3
600	0.0923	27.059	0.144	0.04755	0.00138	0.00532	0.00062	5.8	0.08725	0.00254	0.00042	0.00016	25.463	0.230	110.4	1.0
750	0.1968	28.067	0.138	0.00761	0.00090	0.00434	0.00035	4.6	0.01397	0.00165	0.00044	0.00007	26.757	0.168	115.8	0.7
900	0.3236	28.257	0.144	0.00831	0.00047	0.00312	0.00036	3.3	0.01525	0.00086	0.00035	0.00006	27.306	0.177	118.1	0.7
1150	0.4860	28.995	0.113	0.00638	0.00042	0.00321	0.00023	3.3	0.01171	0.00077	0.00045	0.00008	28.017	0.130	121.1	0.6
1500	0.6485	28.529	0.129	0.00706	0.00045	0.00257	0.00027	2.7	0.01296	0.00083	0.00049	0.00004	27.742	0.149	119.9	0.6
2000	0.7853	28.858	0.110	0.01029	0.00045	0.00296	0.00027	3.0	0.01888	0.00082	0.00041	0.00004	27.955	0.135	120.8	0.6
2500	0.8761	28.903	0.162	0.01864	0.00078	0.00338	0.00038	3.4	0.03419	0.00144	0.00043	0.00010	27.879	0.194	120.5	0.8
3000	0.9217	28.641	0.156	0.04166	0.00148	0.00394	0.00099	4.1	0.07645	0.00271	0.00049	0.00015	27.452	0.329	118.7	1.4
4500	0.9679	29.959	0.166	0.20469	0.00341	0.00430	0.00090	4.2	0.37562	0.00627	0.00075	0.00022	28.679	0.312	123.8	1.3
8000	1.0000	31.643	0.263	0.07166	0.00300	0.00745	0.00133	6.9	0.13150	0.00551	0.00086	0.00029	29.421	0.466	126.9	1.9
Integrated		28.692	0.045	0.05132	0.00035	0.00442	0.00014	4.5	0.09416	0.00065	0.00049	0.00003	27.362	0.059	118.3	0.6

UAF110-25 EF88-42 WM#5 10-02A04 USGSGOLD

Weighted average of J from standards = 0.002478 +/- 0.000013

Laser (mW)	Cum. ³⁹ Ar	⁴⁰ Ar/ ³⁹ Ar measured	+/-	³⁷ Ar/ ³⁹ Ar measured	+/-	³⁶ Ar/ ³⁹ Ar measured	+/-	% Atm. ⁴⁰ Ar	Ca/K	+/-	Cl/K	+/-	⁴⁰ Ar*/ ³⁹ Ar _K	+/-	Age (Ma)	+/- (Ma)
150	0.0028	38.630	0.562	0.13721	0.01321	0.10001	0.00589	76.5	0.25179	0.02424	0.00783	0.00097	9.058	1.703	40.0	7.5
300	0.0135	28.178	0.222	0.19722	0.00404	0.02996	0.00207	31.4	0.36192	0.00742	0.00289	0.00038	19.313	0.634	84.3	2.7
450	0.0414	26.544	0.133	0.35115	0.00304	0.01156	0.00072	12.8	0.64446	0.00558	0.00113	0.00011	23.130	0.245	100.5	1.0
600	0.0956	26.901	0.114	0.06158	0.00060	0.00427	0.00026	4.7	0.11299	0.00111	0.00064	0.00007	25.615	0.135	111.0	0.6
750	0.1987	28.108	0.103	0.02028	0.00045	0.00261	0.00015	2.7	0.03720	0.00082	0.00054	0.00004	27.310	0.111	118.1	0.5
900	0.3191	28.299	0.119	0.01132	0.00033	0.00185	0.00017	1.9	0.02076	0.00060	0.00046	0.00004	27.725	0.128	119.9	0.5
1150	0.4794	29.375	0.106	0.00834	0.00021	0.00211	0.00013	2.1	0.01529	0.00038	0.00040	0.00003	28.722	0.112	124.0	0.5
1500	0.6204	28.741	0.116	0.01415	0.00034	0.00216	0.00014	2.2	0.02596	0.00062	0.00045	0.00003	28.074	0.123	121.3	0.5
2000	0.7667	28.074	0.112	0.01346	0.00022	0.00164	0.00013	1.7	0.02469	0.00040	0.00048	0.00004	27.561	0.117	119.2	0.5
2500	0.8775	28.382	0.104	0.02670	0.00052	0.00229	0.00013	2.4	0.04899	0.00096	0.00037	0.00004	27.680	0.110	119.7	0.5
3000	0.9357	28.767	0.124	0.07467	0.00099	0.00428	0.00025	4.4	0.13701	0.00182	0.00054	0.00009	27.481	0.142	118.8	0.6
4500	0.9774	29.820	0.158	0.16066	0.00146	0.00660	0.00042	6.5	0.29482	0.00268	0.00040	0.00010	27.856	0.196	120.4	0.8
8000	1.0000	31.693	0.216	0.17338	0.00266	0.01019	0.00071	9.5	0.31817	0.00489	0.00049	0.00019	28.669	0.291	123.8	1.2
Integrated		28.561	0.038	0.04231	0.00018	0.00354	0.00006	3.7	0.07763	0.00033	0.00053	0.00002	27.490	0.042	118.9	0.6

UAF110-25 EF88-42 WM#6 10-02B04 USGSGOLD

Weighted average of J from standards = 0.002478 +/- 0.000013

Laser (mW)	Cum. ³⁹ Ar	⁴⁰ Ar/ ³⁹ Ar measured	+/-	³⁷ Ar/ ³⁹ Ar measured	+/-	³⁶ Ar/ ³⁹ Ar measured	+/-	% Atm. ⁴⁰ Ar	Ca/K	+/-	Cl/K	+/-	⁴⁰ Ar*/ ³⁹ Ar _K	+/-	Age (Ma)	+/- (Ma)
150	0.0014	49.241	0.824	0.12778	0.02689	0.14528	0.00977	87.2	0.23448	0.04934	0.01390	0.00245	6.292	2.815	27.9	12.4
300	0.0068	31.079	0.244	0.14914	0.00639	0.04715	0.00293	44.8	0.27368	0.01173	0.00455	0.00059	17.131	0.881	75.0	3.8
450	0.0215	26.609	0.159	0.36697	0.00427	0.01830	0.00112	20.2	0.67350	0.00784	0.00195	0.00023	21.204	0.359	92.4	1.5
600	0.0499	26.596	0.116	0.13060	0.00157	0.00779	0.00067	8.6	0.23965	0.00288	0.00107	0.00015	24.278	0.228	105.4	1.0
750	0.0976	26.772	0.137	0.08589	0.00083	0.00463	0.00036	5.1	0.15760	0.00153	0.00070	0.00009	25.384	0.170	110.0	0.7
900	0.1639	27.118	0.122	0.02956	0.00047	0.00310	0.00025	3.4	0.05423	0.00086	0.00047	0.00006	26.175	0.141	113.4	0.6
1150	0.2852	27.168	0.115	0.02080	0.00028	0.00236	0.00017	2.6	0.03816	0.00051	0.00046	0.00004	26.444	0.124	114.5	0.5
1500	0.4952	27.309	0.337	0.01184	0.00021	0.00231	0.00008	2.5	0.02172	0.00038	0.00050	0.00003	26.599	0.336	115.1	1.4
2000	0.6774	27.081	0.294	0.01595	0.00024	0.00206	0.00010	2.2	0.02927	0.00045	0.00048	0.00002	26.445	0.295	114.5	1.2
2500	0.8190	27.948	0.104	0.02246	0.00031	0.00198	0.00011	2.1	0.04122	0.00057	0.00045	0.00003	27.337	0.108	118.2	0.5
3000	0.8890	28.356	0.106	0.05323	0.00074	0.00363	0.00024	3.8	0.09767	0.00135	0.00051	0.00007	27.260	0.127	117.9	0.5
4500	0.9665	29.595	0.130	0.10474	0.00090	0.00503	0.00020	5.0	0.19219	0.00165	0.00059	0.00006	28.089	0.139	121.4	0.6
8000	1.0000	29.369	0.142	0.11254	0.00150	0.00640	0.00049	6.4	0.20651	0.00276	0.00052	0.00012	27.460	0.200	118.7	0.8
Integrated		27.643	0.093	0.04284	0.00017	0.00366	0.00006	3.9	0.07860	0.00032	0.00058	0.00002	26.536	0.094	114.9	0.7