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$^{40}Ar/^{39}Ar$ Age-Spectrum Data for Rocks of the Bronson Hill Terrane, Central New England

by

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INTRODUCTION

The purpose of this report is to present $^{40}Ar/^{39}Ar$ data from hornblende, biotite, and muscovite separated from metamorphic rocks collected from the Bronson Hill terrane in central New England (Fig. 1). This data was collected to characterize the metamorphic/cooling history of the Bronson Hill terrane.

In the central part of the New England Appalachians the Bronson Hill terrane lies close to the Acadian metamorphic high (Robinson, et al., 1986), but to the south the effects of Alleghanian metamorphism become stronger Brookins, 1970; (Brookins and Armstrong, 1980; Pressel and Armstrong, 1980; Wintsch and Sutter, 1986). The scientific goal of this study is to characterize the transition between the northern Acadian and southern Alleghanian orogenic events in the Bronson Hill terrane. Ultimately, the comparison of the metamorphic cooling history of the Bronson Hill terrane with that of adjacent terranes will allow for a better understanding of the regional tectonothermal evolution of this portion of New England and may reveal some history of terrane assembly.

The primary approach used in this research is $^{40}Ar/^{39}Ar$ mineral age dating (thermochronology). This method monitors the time-temperature history preserved in mineral isotopic compositions, and is especially useful in constraining the times of cooling through closure (Dodson, 1973) from peak metamorphic conditions. The results of our analysis are presented in this report; a preliminary geological interpretation of these results appear in Boyd, et al. (1993) and Wintsch, et al. (1993a;b).

SAMPLING STRATEGY

To characterize the transition between the metamorphic histories of Acadian and Alleghanian orogenic events in the Bronson Hill, samples were collected along a north-south traverse (Fig. 1). The northern limit of sampling was the southern Pelham dome which connects our data to that of Spear and Harrison (1989), and Tucker and Robsinson (1990; 1993) in northcentral Massachusetts and adjacent New Hampshire (Harrison et al. 1989). Samples were collected at 5-10 km intervals from the southern Pelham dome south to Long Island Sound. Amphibolites, granodioritic gneisses, muscovite schists, and pegmatites were collected, and hornblende, muscovite, and biotite were separated.

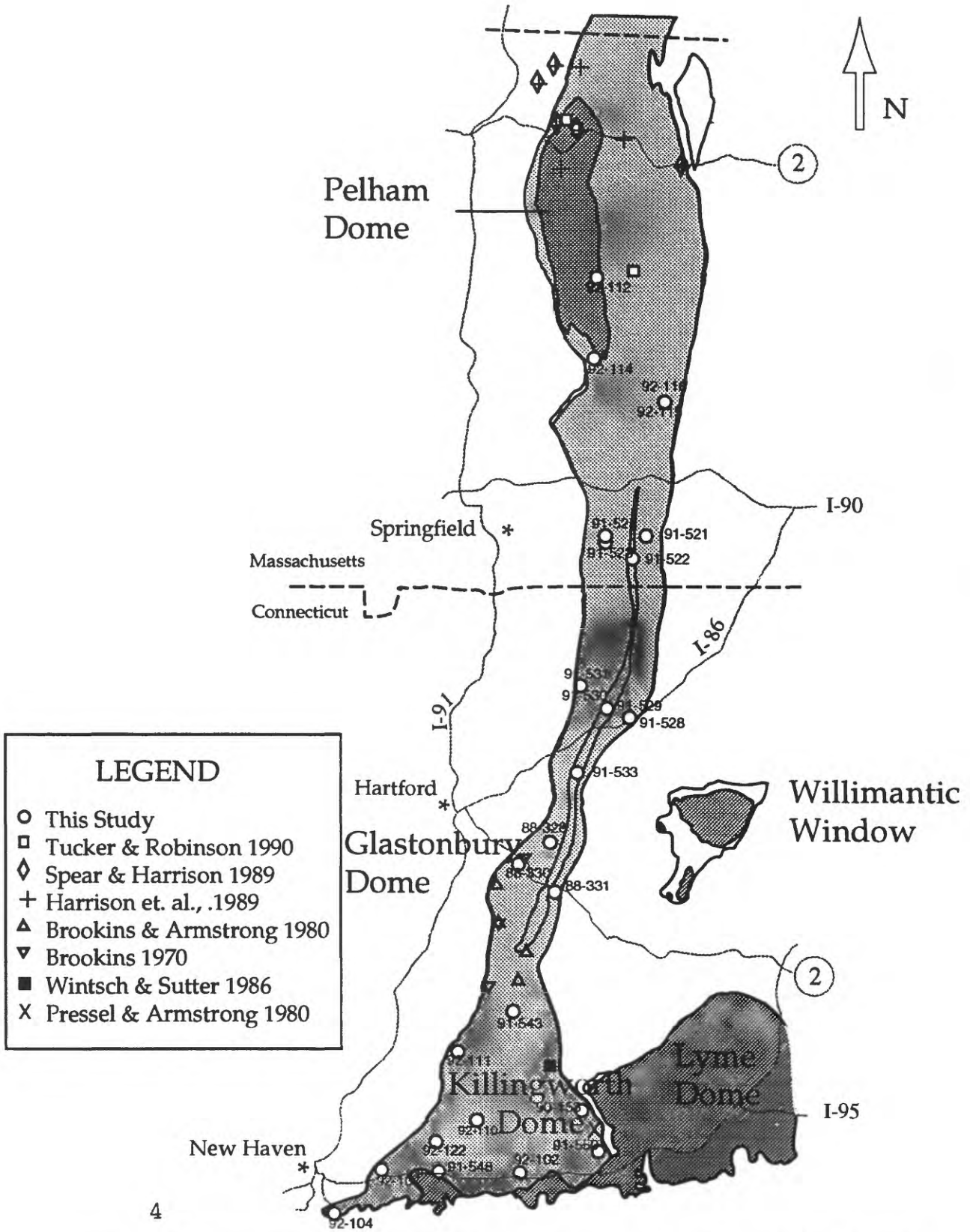

Figure 1. Location map of samples dated. Includes locations of samples not dated in this study (see Legend). The light gray represents the Bronson Hill terrane and the dark gray denotes the Avalon terrane.

METHODS

Sample Preparation

All samples were crushed, ground, and sieved to >250, 180, 150, 125, and <125 μm sizes. The largest size fraction that excluded most composite grains was selected for mineral separation by heavy liquids, magnetic separation and/or paper shaking. Composite grains were eliminated by ultrasonic abrasion where necessary. Purity to >99% of muscovite and biotite and 99.9% for amphibole was checked with a binocular microscope using reflected light.

Approximately 1000 mg. of amphibole, 100 mg. of muscovite, and 50-100 mg. of biotite were packaged in aluminum capsules and sealed under vacuum in quartz tubes. Samples were then irradiated in the central thimble facility at the TRIGA reactor (GSTR) at the U.S. Geological Survey, Denver, Colorado. The monitor mineral was MMHb-1 hornblende which has an age of 519.4 ± 2.5 Ma (Alexander et al., 1978; Dalrymple et al., 1981). The type of container, and the geometry of samples and standards is similar to that described by Snee et al. (1988).

Sample Analysis

All samples were analyzed on a VG Isotopes, Ltd., Model 1200 B Mass Spectrometer at the U.S. Geological Survey, Reston, using the step heating method. Heating for 10 minutes per step followed a schedule of 8-15 steps per sample. The number and temperature of heating steps was selected to limit the percentage of gas released to less than 20%/step for most samples.

Heating of all samples was done in a small volume molybdenum-lined "low blank" tantalum furnace. Temperature was monitored by a W_5Re-$W_{26}Re$ thermocouple and controlled by a proportional, programmable controller. The furnace and the rear manifold were evacuated as necessary by a turbo molecular pump. Two isolated ion pumps evacuated the front manifold and the mass spectrometer tube. During normal operation, the gas to be analyzed was purified in the rear manifold by a Saes ST707 Zr-V-Fe getter operated at room temperature. Gas was equilibrated with the front manifold with an empty cold finger (in the rear manifold) chilled with liquid N_2 to remove condensables (chiefly water), and cleaned in the front manifold by a Saes ST101 Al-Zr getter operated at 400°C and a Ti (H_2) getter operated at a constant 350°C. An activated charcoal finger submerged in a constant boiling mixture of dry ice and acetone was used to remove gasses with a molecular weight greater than 60 or 80 (primarily noble gases) prior to the admission of the argon dominated gas to the mass spectrometer by expansion. The argon-rich gas was further purified in the mass spectrometer by a second Saes ST101 getter operated at room temperature. Its successful

operation could be monitored by the drop in counts of mass 44 (dominated by CO_2) after the first gas analysis cycle. All phases of the analysis; heating, gettering, equilibration, and mass spectrometer analysis were performed under computer control. Argon isotopes with masses 40 through 36 and CO_2, mass 44 were analyzed as a function of time in five analysis cycles. ^{40}Ar, ^{39}Ar, and ^{36}Ar peaks and their baselines, were measured as a series of four, five second integrations in each of the five cycles, that were then averaged. ^{38}Ar and ^{37}Ar peaks, and their baselines, were measured for only one, five second integration per cycle. After the analysis, the mass spectrometer was evacuated. If necessary, the fraction of gas remaining in the front manifold could be introduced into the mass spectrometer for a replicate "split" analysis, but with a signal 3.6 X smaller (see tables below).

Isotopic Data Reduction

All the Ar isotopic data were reduced using an updated version of the computer program ArAr* (Haugerud and Kunk, 1988) and decay constants recommended by Steiger and Jager (1977). The isotopic measurements made in the five cycle analysis had baseline values subtracted and then were regressed, to time zero, using standard linear regression techniques. These regressed values and associated statistical estimates of analytical uncertainties of the time zero peak values were used in the data reduction. No corrections for furnace blanks were made because blanks were routinely less than 0.1% of sample signal at all temperatures.

Corrections for interfering reactor-produced argon isotopes from Ca, K, and Cl in the sample were made using the production ratios given in Dalrymple et al. (1981). Errors included in calculating ages or ratios include analytical errors in the analysis, decay factor uncertainties, measured atmospheric or calculated initial $^{40}Ar/^{36}Ar$ ratios, the irradiation parameter J, the production ratios of the various reactor induced argon producing reactions, the inital $^{36}Ar/^{36}Ar$ ratio, and the age of the monitor (Haugerud and Kunk, 1988).

In this project unique variables arise from the neutron flux as revealed through the calculated J values using Minnesota hornblende MMHb-1 (Alexander et al., 1978) and its age of 519.4 Ma ± 0.5%. Over 20 hornblende monitors were added to a single vial, and these defined a smooth curve where J varied from 0.0088 to 0.0098 across the six, 12 cm. long vials. Monitors were added to the top and/or bottom of each of the other five vials to assess any rotational fluctuation in the 6-vial package; none was found, within the limits of analytical precision. Sensitivities in moles ^{40}Ar/count were calculated from analytical results on Minnesota hornblende MMHb-1 and its published composition (Alexander et al., 1978), and these sensitivity values are included in the data table for each sample.

The tables and figures below include the identification of plateau ages, isochron ages, minimum ages, fusion ages and total gas ages. Plateau ages

include two or more contiguous steps that overlap within experimental error, and whose cumulative $^{39}Ar_K$ comprises greater than 50% of the total potassium derived ^{39}Ar (Fleck et al., 1977; Snee et al., 1988). For all samples analyzed by the $^{40}Ar/^{39}Ar$ age spectrum dating technique, all steps were examined for colinearity on isotope correlation diagrams to assess if non-atmospheric argon components were trapped in any samples and to calculate an isochron age. In several samples points that were deemed to be not colinear were deleted from the isotope correlation diagram. Minimum ages are of a single step (except the first step in the age spectrum) and represent the lowest age measured in a U- or L- shaped spectrum. No analytical precision is stated for minimum ages in Table 1. Fusion ages represent the results of a single analysis in which all of the argon was released by melting in a single step. Total gas ages represent the age calculated from the addition of all of the measured argon peaks for all steps of a single sample. The total gas and fusion ages are equivalent to conventional K/Ar ages. No analytical precision is calculated for total gas ages.

SAMPLE DESCRIPTIONS

The locations and descriptions of sample analyses in this project are given below. Petrographic observations were made on a single thin section cut perpendicular to foliation and parallel to lineation where present. In the descriptions that follow, minerals are listed in decreasing order of abundance. Because of their small size, quartz and plagioclase inclusions in larger mineral grains could not always be differentiated by use of the petrographic microscope. Descriptions focus on the minerals separated and dated.

92-112 42°25'30" N, 72°24'11" W

Location: natural outcrop 800 m north of the intersection of Hwy. 202 with the Franklin Co./Hampshire Co. line, and 400m (0.25 mi) west of Hwy 202, on the west side of the hill at an elevation of ~ 1050 ft. in the Shutesbury 7 1/2' quadrangle, Massachusetts.

Map Unit: Rocky Run Gneiss (Michener, 1983).

Description: Buff, layered, quartz, plagioclase, biotite, epidote, sphene gneiss. Biotite grains range from 300 μm. to 1.5 mm. The parallel alignment of biotite defines a weak foliation. Epidote grains range from 50 μm. to 1.5 mm. in diameter. Many epidote grains contain quartz inclusions that are <200 μm. in diameter. Only biotite was separated.

92-114 42°18'25" N, 72° 24' 18"

Location: roadcut on the west side of Hwy. 202, 800 m north of the intersection of Hwy. 202 with Allen St. in the Belchertown 7 1/2' quadrangle, Massachusetts.

Map unit: Fourmile Gneiss of the Geologic Map of the Pelham-Shutesbury Syncline, Pelham Dome (Michener,1983).

Description: Grey layered, plagioclase, hornblende, biotite, epidote, quartz gneiss. Hornblende grains are equant and range in size from 400 μm. to 3 mm. long. Many amphibole grains contain plagioclase inclusions that range from <100 μm. to 300 μm. in diameter. A few amphiboles contain epidote and/or smaller amphibole inclusions: epidote inclusions are subhedral and range from <100 to 200 μm. in diameter. Rare amphibole inclusions are subhedral and are up to 500 μm. in length. Some amphiboles have rims of actinolitic composition. Biotite defines a foliation that truncates amphibole. Biotite grains range from ~300 μm. to 3mm. long and some contain inclusions of plagioclase that are ~100 μm. in diameter. Epidote grains range from ~200 μm. to 1mm. in length. Only hornblende was separated.

92-115 42°15'43" N, 72°17'26" W

Location: outcrop on the north side of Hwy. 9 , ~ 4 km west of the junction of Hwy. 32 and Hwy 9 at Brimstone Hill in the Winsor Dam 7 1/2' quadrangle, Massachusetts.

Map unit: Amphibolite member of the Partridge Formation (Robinson et. al., 1986).

Description: Grey, hornblende, plagioclase, biotite, quartz, chlorite, granofelsic amphibolite. Most hornblende grains are equant and range from 500 µm. to 3 mm. in diameter. Most hornblende grains contain inclusions of quartz and/or plagioclase that range from 100 µm. to 500 µm. in diameter. Biotite grains range from 300 µm. to ~2 mm. in length and commonly crosscut hornblende and plagioclase and other biotite grains. Equant plagioclase and quartz grains range from 300 µm. to ~2 mm. in diameter. Hornblende and biotite were separated.

92-116 42°15"43" N, 72°17'26" W

Location: outcrop on the north side of Hwy. 9 , ~ 4 km west of the intersection between Hwy. 32 and Hwy 9 at Brimstone Hill in the Winsor Dam 7 1/2' quadrangle, Massachusetts.

Map unit: Partridge Formation (Robinson et. al., 1986, step #2).

Description: Buff, plagioclase, quartz, biotite, muscovite pegmatite. Biotite books range from 1 to 5mm. thick. Only biotite was separated.

91-524 42°5'51" N, 72°23'59" W

Location: outcrop on east side of Glendale Rd., 1.5 km south of the intersection between Glendale Rd. and Monson Rd. and two miles east of the town of Wilbraham in the Hampden 7 1/2' quadrangle, Massachusetts.

Map unit: Pegmatite in the Glastonbury Gneiss (Middle Devonian to Middle Ordovician) of the Hampden 7 1/2' quadrangle (Peper, 1977a).

Description: Buff to white, coarse grained, plagioclase, K-feldspar, quartz, muscovite pegmatite. Muscovite books are ~3mm. thick. Muscovite was separated.

91-521 42°5'44" N, 72°19'28" W

Location: an abandoned rock quarry just north of the intersection between Paradise Lake Rd. and Ely Rd. in the Monson 7 1/2' quadrangle, Massachusetts.

Map unit: Monson Gneiss (Middle Ordovician or older) of the Monson 7 1/2' quadrangle (Peper, 1977b).

Description: Black, hornblende, plagioclase, epidote, clinozoisite amphibolite. About 1/4 of the amphibole grains are elongated and others are equant. Elongated hornblende grains range in size from 1 to 4 mm. in length while equant grains range from 0.5 mm to 2 mm. in diameter. The elongated and equant hornblende grains are randomly oriented and are intergrown. Only a very few hornblende grains contain inclusions of plagioclase and/or quartz. These inclusions are <200 µm. in diameter. Most plagioclase grains are euhedral and range from 0.5 mm. to 3.5 mm. in diameter. Twinning is noticeable in almost all plagioclase grains. Both epidote-clinozoisite occur with patches of plagioclase grains. Most epidote grains are euhedral and are ~200 µm. in diameter. Clinozoisite grains range in length from 300 µm. to 1.5mm. Only hornblende was separated.

91-523 42°5'34" N, 72°23'57" W

Location: 3.2 km east of the town of Wilbraham, a roadcut on the west side of Glendale Rd., 2.4 km south of the intersection of Monson Rd. and Glendale Rd. in the Hanpden 7 1/2' quadrangle (Peper, 1977a).

Description: Dark grey, foliated, hornblende, biotite, plagioclase, clinoziosite, epidote, quartz amphibolite. There are elongated hornblende grains and oval to round, anhedral hornblende porphyroblasts. The hornblende porphyroblasts range from 0.5 mm. to 2.5 mm. in diameter. Both the elongated hornblende grains and the hornblende porphyroblasts contain inclusions of quartz and/or plagioclase that range from <100 µm. to 300 µm. in diameter. A few of the larger porphyroblasts also contain inclusions of subhedral epidote, clinozoisite, and hornblende grains that are up to 500 µm. long. The foliation wraps around the porphyroblasts. Elongated hornblendes range from 0.5 to 2 mm. long. Biotite grains also range from 0.5 to 2 mm. long. Epidote and clinozoisite are associated with biotite and most are zoned. Epidotes are subhedral and range from 100 to 300 µm. in diameter. Clinozoisite grains are also subhedral and range from 100 µm. to 1 mm. long. Plagioclase grains are equant and most are optically zoned. Hornblende and biotite were separated.

91-522 42°4'14" N, 72°21'15"W

Location: natural outcrop on the west side of Wood Hill Rd. 300 m north of the intersection between Wood Hill Rd. and Lower Hampden Rd. in the Monson 7 1/2' quadrangle, Massachusetts.

Map unit: Littleton formation of the Monson 7 1/2'quadrangle (Peper, 1977b).

Description: This rock is very similar to sample 91-529 except that this sample contains atolled garnets and staurolite grains ranging from 200 µm to 3 mm. in length. Only muscovite was separated.

91-530 41°54'16" N, 72°26'42" W

Location: Roadcut 2.3 km due east of the town of Ellington on the east side of Pinnacle Rd., 1.5 km north of its intersection with Shenipsit Lake Rd. in the Ellington 7 1/2' quadrangle, Connecticut.

Map unit: Middletown Formation- pegmatite within the hornblende schist, Ellington 7 1/2' quadrangle (Collins, 1954).

Description: Buff to white, coarse grained, K-feldspar, plagioclase, quartz, muscovite pegmatite. Muscovite books are ~4mm. thick. Muscovite was separated.

91-531 41°54'14" N, 72°26'47" W

Location: Roadcut 1.8 km due east of the town of Ellington on the west side of Pinnacle Rd., 1.5 km north of its intersection with Shenipsit Lake Rd. in the Ellington 7 1/2' quadrangle, Connecticut.

Map unit: Middletown Formation - hornblende schist member, Ellington 7 1/2' quadrangle (Collins, 1954).

Description: Greyish green, well foliated, hornblende, plagioclase, quartz, epidote amphibolite. The foliation is defined by elongated hornblende grains ranging from 1 mm. to 3 mm. in length and from 200 to 500 µm. in width. Many hornblende grains contain inclusions of quartz and/or plagioclase that are ~50 to 100 µm. in diameter. Quartz and plagioclase grains are also elongated and range from 0.5 mm. to 1.5 mm. in length. Epidote and clinozoisite grains are mostly subhedral and range from 200 µm. to 1 mm. in length. Epidote and clinozoisite are randomly oriented and crosscut hornblende. Only hornblende was separated.

91-529 41°52'41" N, 72°23'48" W

Location: Natural outcrop in the southeast corner of the Ellington 7 1/2' quadrangle, 300m due east of Poehnarts Pond on the east side of the hill at an elevation of approximately 935 ft.

Map unit: Bolton Schist of the Ellington 7 1/2' quadrangle (Collins, 1954).

Description: Buff to tan, strongly foliated, muscovite, biotite, quartz, plagioclase, garnet, staurolite, chlorite schist. This layered rock contains phyllosilicate dominated and quartz-dominated domains. These domains are discontinuous and vary in thickness from 2.0 mm. to 6.0 mm. In both domains the foliation is defined by muscovite and biotite. The phyllosilicate dominated domains are composed of 75% muscovite and biotite folia, 10% quartz grains, 5% biotite porphyroblasts, and 10% garnet and staurolite porphyroblasts. The quartz dominated domains contain 70% quartz, 15% muscovite and biotite folia, 5% staurolite, 5% garnet, and 5% biotite porphyroblasts. The muscovite and biotite grains that define the foliation range from 1 to 2mm. in length. This foliation wraps around the garnet, biotite, and staurolite porphyroblasts. The garnets are euhedral to subhedral and range from 1.5 to 4mm. in diameter; some have a few quartz inclusions. The biotite porphyroblasts are slightly elongated and range from 1 to 2.5 mm in length. Most staurolite porphyroblasts are elongated and range from 2 to 6 mm. in length. The quartz grains are slightly elongated and range from 300 μm. to 1.5 mm. in length. Chlorite is usually associated with staurolite and crosscuts the porphyroblasts and the foliation. Muscovite and biotite were separated.

91-528 41°51'57" N, 72°21'42" W

Location: Northeast end of parking lot north of intersection of I86 with Conn. Route 195 in the South Coventry 7 1/2' quadrangle, Connecticut.

Map unit: Monson Gneiss of the South Coventry 7 1/2' quadrangle (Fahey and Pease, 1977).

Description: Dark grey, finely layered, plagioclase, quartz, hornblende, biotite, epidote, clinozoisite gneiss. Hornblende, biotite, epidote, and clinozoisite occur in layers separated by quartz and plagioclase rich layers. Plagioclase and quartz grains are equant and range from 300 μm. to 1 mm in diameter. Some plagioclase grains contain inclusions of quartz, and veins of quartz from 1 to 2 mm. in width and ~1cm. long are present. Hornblende grains are subhedral to anhedral and sides parallel to the cleavage of hornblende are commonly straight in some grains, in other grains the hornblende grain boundaries are

strongly serrated and interlobate with adjacent plagioclase grains. The hornblende grains range from 300 μm. to 2 mm. in diameter. Many hornblende grains contain plagioclase, quartz inclusions ranging from 100 to 500 μm. in diameter. Biotite grains define a weak foliation and range from 300 μm. to 1 mm. in length. Some epiodote grains contain inclusions of quartz that are ~100 μm. in diameter. Hornblende and biotite were separated.

91-533 41°48'08" N, 72°24'34" W

Location: 1.1 km north of the northern tip of Bolton Notch Pond and 150m west of Railroad Brook at the noll of elevation 660 ft. in the Rockville 7 1/2' quadrangle, Connecticut.

Map unit: Bolton Schist-"quartzitic phase" of the Rockville 7 1/2' quadrangle (Aitken, 1955).

Description: Grey to tan, hornblende, quartz, biotite, clinozoisite, garnet plagioclase, chlorite amphibolite. Hornblende grains range from 100 μm. to 0.5 mm. in diameter. Most contain quartz and/or plagioclase inclusions that are less than 100 μm. in diameter. Equant quartz and plagioclase grains range from 100 μm. to 400 μm. in diameter. Subhedral to anhedral garnets range from 300 μm. to 2 mm. in diameter. Most garnets contain quartz inclusions from 100 to 300 μm. in size. Biotite grains range from 300 μm. to 700 μm. in length. Chlorite occurs near garnet. Garnet crosscuts all adjacent grains. Garnet concentration may exceed 50% in some layers where garnets are as large as 3.5 mm., and amphiboles are up to 2 mm. long. Clinozoisite grains are subhedral and occur in areas where there is no garnet. Only hornblende was separated.

88-328 41°42'26" N, 72°29'25" W

Location: Contact metamorphic zone around metagranite intruding Glastonbury gneiss (Ambers, 1988) 300 m. south of Connecticut Route 94, 1.6 km west of the contact between the Glastonbury dome and Clough quartzite in the Marlborough 7 1/2' quadrangle, Connecticut.

Map unit: Glastonbury Gneiss of the Marlborough 7 1/2' quadrangle (Snyder, 1970).

Description: Hornblende, biotite, quartz, epidote, plagioclase, clinozoisite, microcline, sphene hornfels. The hornblende, biotite, epidote, and clinozoisite occur in layers separated by quartz and plagioclase rich layers. A weak foliation is defined by biotite. Hornblende grains are subhedral and some are slightly elongated and range from 1 to 4 mm. in length. Some

hornblende grains have quartz, plagioclase, and/or biotite inclusions. The quartz and plagioclase inclusions range from 100 to 300 μm. in diameter and the biotite inclusions range from 200 to 500 μm. in length. The biotite grains range from 500 μm. to 1.5 mm in length. Quartz and plagioclase grains are equant and range from 400 μm. to 1.5 mm. Small anhedral microcline is associated with quartz and plagioclase. Both epidote and clinozoisite are subhedral and range from 200 μm. to 800 μm. in length. Many epiodte and clinozoisite grains are zoned. Euhedral to subhedral sphene is associated with biotite and epidote. Only hornblende was separated.

88-330 41°40'53" N, 72°33'19" W

Location: Collected from an excavation around an electrical substation on the south face of a hill 50 m. north of Chestnut Hill Rd., 300 m. west of its intersection with the New London turnpike in the Glastonbury 7 1/2' quadrangle, Connecticut.

Map unit: Glastonbury Gneiss of Glastonbury 7 1/2' quadrangle (Herz, 1955).

Description: Quartz, plagioclase, biotite, epidote, hornblende, gneiss. Some quartz and plagioclase grains are over 1cm. in diameter. These large grains sometimes contain inclusions of smaller quartz or plagioclase grains. Other quartz and plagioclase grains range from 200 μm. to 1 mm. in diameter. Biotite, epidote, and hornblende occur in layers separated by plagioclase and quartz. Biotite defines a weak foliation. Biotite grains range from 200 μm. to 1.5 mm. in length. Subhedral epidote grains range from 100 μm. to 400 μm. in diameter. Hornblende grains are somewhat elongated and grain boundaries are commonly serrated and interlobate with adjacent plagioclase or quartz grains. Hornblende grains range from 0.5 to 1.5 mm. in length. Most hornblende grains contain epidote inclusions that are <200 μm. in diameter. Only hornblende was separated.

88-331 41°39'1" N, 72°29'39" W

Location: Exit ramp off of eastbound Connecticut Route 2 at Portland Rd., 3.2 km east of Marlborough village in the Marlborough 7 1/2' quadrangle, Connecticut.

Map unit: Monson Gneiss of Marlborough 7 1/2' quadrangle (Snyder, 1970) .

Description: Hornblende, plagioclase, quartz, epidote, biotite, granofelsic amphobilite. Hornblende grains are subhedral to anhedral and sides parallel to the cleavage of the hornblende are commonly straight in some grains, in other grains the grain boundaries are

strongly serrated and interlobate with adjacent plagioclase grains. The hornblende grains range from 300 μm to 1.5 mm in diameter. Many hornblende grains contain quartz and/or plagioclase inclusions 100 to 300 μm. in diameter. Equant plagioclase and quartz grains range from 300 μm. to 1 mm. in diameter. Most epidote grains are subhedral and ~300 μm. across. Biotite distribution is patchy, and grains range from 400 μm. to 1 mm. in length. Only hornblende was separated.

91-543 41°29'45" N, 72°34'19" W

Location: twelve cm. thick amphibolite in a plagioclase gneiss outcrop on the west side of Route 9, under the overpass of Christian Hill Rd., 3.2 km west of Higganum in the Haddam 7 1/2' quadrangle, Connecticut.

Map unit: Monson Gneiss of the Haddam 7 1/2' quadrangle (Lundgren, 1979).

Description: Grey layered, hornblende, plagioclase, quartz, biotite amphibolite. Most hornblende grains are elongated and range from 1 to 6 mm. in length. Some hornblende grains have quartz and/or plagioclase inclusions that are approximately 50 to 150 μm. in diameter. Plagioclase grains are 200 μm. to 1 mm. in diameter. Some plagioclase grains show optical zoning. Hornblende grains appear in layers separated by plagioclase layers. Minor biotite crosscuts the banding. Hornblende was separated.

92-111 41°26'44" N, 72°39'49" W

Location: roadcut on the west side of Hwy. 79, 110 m north of the intersection between Hwy. 79 and Pisgah Rd., 800 m north of the Killingworth/Durham town line in the Durham 7 1/2' quadrangle, Connecticut.

Map unit: Pegmatite cutting Brimfield, Collins Hill Formation (Rodgers, 1985).

Description: Buff, coarse grained, K-feldspar, plagioclase, quartz, muscovite pegmatite. Muscovite books are ~5 mm. thick. Only muscovite was separated.

92-109 41°23'1" N, 72°26'59" W

Location: Southbound exit ramp at interchange 5 Conn. Route 9 in the Deep River 7 1/2' quadrangle, Connecticut.

Map unit: Pegmatite cutting Monson Gneiss of Deep River 7 1/2' quadrangle (Lundgren, 1963).

Description: Buff, plagioclase, quartz, biotite, zircon pegmatite. Biotite books range from 0.5 to 7 mm. thick. Only biotite was separated.

90-153 41°23'1" N, 72°26'59" W

Location: Southbound exit ramp at interchange 5 Conn. Route 9 in the Deep River 7 1/2' quadrangle, Connecticut.

Map unit: Middletown Formation of Deep River 7 1/2' quadrangle (Lundgren, 1963).

Description: Black hornblende-plagioclase-epiodite massive amphibolite. Hornblende grains are 1-5 mm in diameter, with intersticial plagioclase 0.5-1.0 mm in diameter. Only hornblende was separated.

92-110 41°21'38" N, 72°38'15" W

Location: roadcut 60 m northeast of the intersection (roundabout) between Hwy. 80 and Hwy 79 at North Madison in the Guilford 7 1/2' quadrangle, Connecticut.

Map unit: Monson Gneiss (Rodgers, 1985).

Description: Hornblende, plagioclase, garnet, weakly layered, gneiss. Most hornblende grains are elongated and have grain boundaries that are serrated and interlobate with adjacent plagioclase grains. Hornblende grains range from 300 μm. to 3 mm. in length. A few hornblende grains contain inclusions of plagioclase that are ~100 mm. in diameter. Equant plagioclase grains range from 200 μm. to 2 mm. in diameter, and most show optical zoning. Minor garnet (some a toll-shaped) occurs only in small layers; most range from 100 to 600 μm. in diameter and are in contact with hornblende. Rare garnet is 2 mm. and contains many quartz inclusions. Only hornblende was separated.

92-122 41°19'55" N, 72°42'24" W

Location: outcrop on east side of Hwy. 77 (north of Interstate 95), 1.8 km north of Stepstone Hill Rd. in the Guilford 7 1/2'quadrangle, Connecticut.

Map unit: Middletown or Collins Hill Formation (Rodgers,1985).

Description: Black, well foliated, hornblende, quartz, plagioclase amphibolite. Elongated amphibole grains make up ~90% of the rock and range in size from 1mm. to 1cm. in length and from 300 µm. to 1 mm. in width. Some of the hornblende grains have quartz and plagioclase inclusions that are approximately 100 µm. in diameter. Quartz and plagioclase grains are not equant and range in size from 300 µm. to 1.5 mm. Only hornblende was separated.

91-550 41°18'59" N, 72°26'2" W

Location: roadcut on east side of Brook Plains Rd. 2.9 km north of interchange 65 in the Essex 7 1/2' quadrangle, Connecticut.

Map unit: Monson Gneiss of the Essex 7 1/2' quadrangle (Lundgren, 1964).

Description: Dark to light gray, layered, quartz, plagioclase, hornblende, biotite, magnetite, gneiss. Equant quartz and plagioclase grains range from 200 µm. to 1.5 mm. in diameter. Some plagioclase grains show optical zoning. Hornblende grains are subhedral to anhedral. The sides parallel to the cleavage of the hornblende grains are commonly straight in some grains, in other grains the grain boundaries are strongly serrated and interlobate with adjacent plagioclase grains. Hornblende grains range from 200 µm. to 4 mm. long. Some of the hornblende grains have quartz inclusions that are approximately 200 to 400 µm. in diameter and many are crosscut by biotite grains. Most hornblende grains occur in aggregates separated by plagioclase and quartz. Biotite grains range from 200 µm. to 2mm. in length and define a moderate foliation subparallel to layering. About 10% of biotite grains are randomly oriented and crosscut the foliation. Hornblende and biotite were separated.

92-107 41°17'55" N, 72°48'15" W

Location: natural outcrop on the north side of Short Rocks Rd. (northern side of Interstate 95), just 120 m east of the intersection between Short Rocks Rd. and Chestnut St. (where Chestnut St. goes between the Branford Supply Ponds) at an elevation of 15 m in the Branford 7 1/2' quadrangle, Connecticut.

Map unit: Branford Gneiss (Rodgers, 1985).

Description: Dark grey, hornblende, plagioclase, epidote, granofelsic amphibolite. Hornblende grains are equant and commonly have serrated grain boundaries that are interlobate with adjacent plagioclase grains. Hornblende grains range from 500 µm. to 2 mm. in diameter. Most hornblende grains contain inclusions of plagioclase that range from 100 to 600 µm. in diameter. Plagioclase grains are equant and range from 300 µm. to 1.5 mm. in diameter. Minor epidote grains are ~300 µm. in diameter. Only hornblende was separated.

91-548 41°17'43" N, 72°42'18" W

Location: roadcut on the northeast side of route 460 m south of I-95 Interchange 57 in the Guilford 7 1/2' quadrangle, Connecticut.

Map unit: Waterford Group (Rodgers, 1985).

Description: Hornblende, plagioclase, biotite, garnet, quartz amphibolite. Hornblende grains range from 300 µm. to 1mm. in diameter. Some hornblende grains contain quartz and/or plagioclase inclusions <200 µm. in diameter. Equant plagioclase and quartz grains range from 300 µm. to 1mm. in diameter. Most plagioclase grains are optically zoned. Anhedral garnets occur in a layer and range from 1 mm. to 3 mm. in diameter. These garnets contain many quartz inclusions that range from 100 to 600 µm. in diameter. Biotite flakes range from ~300 µm. to 1.5 mm. long. Biotite flakes occur throughout the slide, but are most numerous within the garnet-rich layer where they commonly crosscut garnet. Hornblende and biotite were separated.

92-103 41°17'43" N, 72°42'18" W

Location: roadcut on the northeast side of route 460 m south of I-95 Interchange 57 in the Guilford 7 1/2' quadrangle, Connecticut.

Map unit: Monson Gneiss (Rodgers, 1985).

Description: Buff to white, coarse grained, K-feldspar, plagioclase, quartz, muscovite pegmatite. Muscovite books are ~0.5 cm. thick. Muscovite was separated.

92-102 41°17'25" N, 72°33'44" W

Location: Roadcut located northeast of the intersection of I-95 and hwy 81 (interchange 62), just 30 m east of the Nodd Rd. square near the junction with River Rd. in the Clinton 7 1/2' quadrangle, Connecticut.

Map unit: Monson Gneiss of Clinton 7 1/2' quadrangle (Lundgren and Thurrell, 1973).

Description: Medium gray, massive, quartz, plagioclase, hornblende, biotite, magnetite gneiss. Equant quartz and plagioclase grains range from ~200 µm. to 1.5 mm. in diameter. Hornblende grains are subhedral to anhedral. Sides parallel to the cleavage of the hornblende are commonly straight in some grains, in other grains the hornblende grain boundaries are strongly serrated and interlobate with adjacent plagioclase grains. Hornblende grains range from 200 µm. to 2.5 mm. long. Most of the hornblende grains have quartz and/or plagioclase inclusions that are 200 to 700 mm. in diameter. Most hornblende grains occur in aggregates separated by plagioclase and quartz. Biotite grains range from ~200 µm. to 2.0 mm. in length and some crosscut hornblende grains. Only hornblende was separated.

92-104 41°14'31" N, 72°53'39" W

Location: natural outcrop collected at South End on the southeastern promentory of Morgan Point in the Woodmont 7 1/2' quadrangle, Connecticut.

Map unit: Light house Gneiss (Rodgers, 1985).

Description: Biotite books ~1 cm. thick were collected from a granite. Thin section not available.

RESULTS

$^{40}Ar/^{39}Ar$ Data

The $^{40}Ar/^{39}Ar$ data presented in this report are presented in two different formats. Data within both formats are arranged in the same order as the section on sample descriptions, from north to south. The first of these formats is a condensed tabular form (Table 1). These tables summarize the data contained in the succeeding, more detailed individual data sets. Included in this table are: the sample numbers; the material analyzed, the apparent age and its error (see below for a detailed explanation); the percent ^{39}Ar of the total that this apparent age represents; the number of steps/total number of steps that this apparent age represents; the MSWD, for isochron ages; the initial $^{40}Ar/^{36}Ar$ used in calculating the apparent age (or atmos. if 295.5 was used); and a comment listing the type of apparent age.

The individual data sets include a series of four tables, as well as three graphical representations of some of the age spectrum data. Total fusion analyses have no figures.

The first table, RAW DATA, includes the computer file number of the individual argon analysis, the temperature of the step, regressed peak values and their precision, the trap current (filament amperage, in microamps) and the manifold splitting option used. The relationship between the trap currents and manifold options can be found in the footnotes of the third table. No corrections have been made to the peak values, these are raw numbers.

The second table, CORRECTIONS, contains calculated corrections for decay of radioactive isotopes of argon, as well as the production of interfering isotopes during irradiation and, a calculated initial ^{38}Ar value. All of these values have been corrected only for the affects of mass discrimination as discerned by measuring atmospheric argon. The measured atmospheric argon value used is listed in the footnote of table three. All tabular data in this table, as well as the two subsequent tables, is indexed by the temperature of the step analyzed.

The third table includes the percent ^{39}Ar of the age spectrum total that each step contains, the radiogenic yield (percentage of ^{40}Ar that is derived from the decay of potassium), calculated apparent K/Ca and K/Cl ratios for each step, a corrected $^{40}Ar/^{39}Ar$ ratio (labeled F) from which the age can be directly calculated, a calculated age for the step, in millions of years and a series of three estimates of the precision of each age. The intra-sample precision includes estimates of the errors that are unique to a single sample and can be used only for comparisons with other steps of the same sample. The intra-package precision includes an estimate of the precision of

the irradiation parameter J and can be used to compare total fusion analyses that used the same monitor mineral. This estimate of precision should not be used to compare steps either within a single age spectrum or between different age spectra. The inter-package precision includes an estimate of the precision of the age of the monitor mineral and should not be used for comparisons of any data contained in this report. Also included, as a footnote, is an estimate of the limit of reproducibility of the mass spectrometer when the sample was analyzed. If an intra-sample error is less than this value times the age of the step, this value should be used when comparing with other steps from the same age spectrum.

The fourth data table lists molar quantities of the indicated argon isotope derived from the sources indicated. The age and the estimate of intra-sample precision are repeated. The J-value and its precision estimate, and sample weight are listed near the top of this table. If an age plateau, as defined above, was found, it is listed at the bottom of this table along with an estimate of its intra-package precision, the percent ^{39}Ar contained in the plateau and the temperatures of the first and last steps on the plateau. All precision estimates, in all tables, are at the one sigma level of confidence. The first figure with each age spectrum data set includes two graphs. The lower and larger graph plots cumulative percent ^{39}Ar of the steps in the age spectrum against apparent age in millions of years. The precision estimate used to construct the error boxes of each step is two sigma. The upper, smaller graph plots the apparent K/Ca ratio of each step against cumulative ^{39}Ar released. Many times the degree of sample purity or the presence of compositional zoning can be inferred from this figure. Homogeneous samples with no compositional zoning or impurities are reflected by horizontal patterns in this figure, the patterns of those with zoning or impurities typically depart from horizontal.

All hornblende age spectra data sets have a third figure included, an inverse isotope correlation diagram. In this figure the corrected $^{39}Ar/^{40}Ar$ ratio of each temperature step of an age spectrum is plotted against its corrected $^{36}Ar/^{40}Ar$ ratio. The intercept of the line generated by these points with the X-axis of the graph is the inverse of the $^{40}Ar/^{39}Ar$ ratio of those points included on the line, and an age can be directly calculated from this value. The Y-axis intercept is the inverse of the initial $^{40}Ar/^{36}Ar$ ratio of the sample. This value can be used to indicate the presence of excess argon. Values for these intercepts and their inverse ratios as well as their errors can be found either above or below this figure. Also included are an age calculated from the inverse of the X-axis, an MSWD, for the points included in the calculations, a list of points that were not used in the regression and the percent ^{39}Ar included in the line. For additional information on the sample datasets see Haugerud and Kunk (1988).

TABLE 1. Summary of argon isotopic results from the Bronson Hill terrane

SAMPLE	MIN	AGE (Ma)	$\%^{39}Ar$	STEPS TOTAL	MSWD	$^{40}Ar/^{36}Ar$	COMMENT
92-112	Bi	243	100	1/1		atmos.	total fusion
92-114	Hb	288,8	15.1	3/10	0.024	728,152	isochron
		297	14.6	1/10		atmos.	minimum
92-115	Hb	330,2	65.6	4/5	3.01	291,5	isochron
		329	10.1	1/5		atmos	minimum
92-116	Bi	259	100	1/1		atmos.	total fusion
91-524	Mu	252,2	98.7	8/9	0.515	408,68	isochron
		252	12.7	1/9		atmos	minimum
91-521	Hb	314,4	78.0	3/8	0.554	690,94	isochron
		310	2.9	1/8		atmos	minimum
91-523	Hb	346,2	81.6	3/7		atmos.	plateau
		345,2	91.0	4/7	1.06	327,54	isochron
	Bi	290	100	1/1		atmos	total fusion
91-522	Mu	251,6	47.2	4/9	1.95	521,398	isochron
		250	6.8	1/9		atmos	minimum
91-530	Mu	252,1	90.1	3/4		atmos.	plateau
		252,8	90.1	3/4	0.021	340.939	isochron
91-531	Hb	294,1	66.6	3/5		atmos.	plateau
		293,6	66.6	3/5	0.571	308,262	isochron
91-529	Mu	250,1	100	8/8	0.579	414,35,	isochron
		252	12.7	1/9		atmos	minimum
	Bi	280	100	1/1		atmos.	total fusion
91-528	Bi	255	100	1/1		atmos.	total fusion
91-533	Hb	268,1	51.8	2/4		atmos	plateau
		263,18	78.2	3/4	2.50	540,590	isochron
88-328	Hb	273,3	99.3	11/13	0.428	546,117	isochron
		271	12.0	1/13		atmos	minimum
88-330	Hb	274,3	97.7	10/13	0.91	268,80	isochron
		272	12.0	1/13		atmos	minimum
88-331	Hb	265,1	100	9/9	32.07	483,16	isochron
		264,1	14.5	1/9		atmos	minimum

TABLE 1.(Cont.) Summary of argon isotopic results from the Bronson Hill terrane

SAMPLE	MIN	AGE (Ma)	$\%^{39}Ar$	STEPS TOTAL	MSWD	$^{40}Ar/^{36}Ar$	COMMENT
91-543	Hb	272,4	100	9/9	2.05	1028,263	isochron
		268	13.1	1/9		atmos	minimum
92-111	Mu	242,1	100	5/5		atmos.	plateau
		242,2	100	5/5	0.071	325,29	isochron
92-109	Bi	248	100	1/1		atmos.	total fusion
90-153	Hb	245,7	92.2	7/8	0.814	295,306	isochron
92-110	Hb	257,1	54.8	3/4		atmos.	plateau
		257,1	54.8	3/4	5.37	294,2	isochron
92-122	Hb	252,1	100	4/4		atmos.	plateau
		251,2	100	4/4	0.051	300,4	isochron
91-550	Hb	258,1	99.0	7/8		atmos.	plateau
		257,2	99.0	7/8	0.035	344,94	isochron
	Bi	256	100	1/1		atmos	total fusion
92-107	Hb	263,1	58.2	3/6		atmos	plateau
		262,1	82.0	5/6	0.856	298,7	isochron
91-548	Hb	249,1	82.3	3/8	0.075	359,9	isochron
		247	2.8	1/8		atmos	minimum
	Bi	252	100	1/1		atmos.	total fusion
92-103	Mu	243,1	58.9	7/8		atmos.	plateau
		243,1	58.9	7/8	0.581	304,6	isochron
92-102	Hb	259,1	79.1	5/9		atmos	plateau
		259,3	79.1	5/9	0.006	328,202	isochron
92-104	Bi	242	100	1/1		atmos	total fusion

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R A W D A T A

FILE	TEMP	40Ar	39Ar	38Ar	37Ar	36Ar	TRAP	MANIFOLD
						ä regression	CURRENT	OPTION
34845	1450	2061213	129042	3756	12	107	100	EALL
	▪	2641	147	6	14	3		

C O R R E C T I O N S

TEMP	39Ar	37Ar	-----K-derived----			----Ca-derived----			Cl-der	Initial
C	Decay	Decay	40Ar	38Ar	37Ar	39Ar	38Ar	36Ar	36Ar	38Ar
1450	82	61	734	1732	0	0	0	0	0	20

All values in counts, corrected for mass discrimination

	TEMP C	% TOT 39Ar	RAD YIELD	APP K/Ca	APP K/Cl	F	AGE (Ma)	precision intra-sample	precision intra-package	precision inter-package
A	1450	100.0	98.5	915.60	153	15.700	242.62 ▪	.31	1.18	1.64

Total gas K/Ca = 915.6

Precisions are 1 sigma, measured in Ma. Measured 40/36 atm = 296.5 ▪.5
J = 0.009169 ▪ 0.50% (intra-package) ▪ 0.50% (inter-package)
Trap current factors- 40: 5.66 100: 2.26 200: 1
Manifold factors- ALL: 1 SPLIT 1: 3.67 SPLIT 2: 10.89 SPLIT 3: 35.937
EALL: 2.1167 ESPLIT 1: 6.6 ESPLIT 2: 21.78
Sensitivity = 1.475E-17 % Reproducibility = .25 Detection limit = 40 counts
Data reduced assuming initial 40/36 = 295.50 ▪ 0.00
Ca-factors: 3637=2.6E-04▪1.7E-06 3837=3.2E-05▪2.4E-07 3937=6.7E-04▪3.7E-06
K-factors: 3739=0.0E+00▪2.2E-03 3839=1.3E-02▪2.4E-04 4039=5.7E-03▪4.0E-03

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J = 0.009169 ▪ 0.50% SAMPLE WT = 0.0501 g

TEMP C	Initial & radiogenic 40Ar	Potassium derived 39Ar	Chlorine derived 38Ar	Calcium derived 37Ar	Initial 36Ar	AGE* in Ma	**
1450	1.454E-10	9.119E-12	1.447E-13	5.179E-15	7.530E-15	242.62 ▪	.31

Note: all gas quantities are in moles. No blank correction.
* Ages calculated assuming initial 40Ar/36Ar = 295.5 ▪ 0
** 1-sigma precision estimates are for intra-sample reproducibility.
** 1-sigma precision estimates for plateaux are for intra-irradiation package reproducibility.
*** below detection limit

R A W D A T A

FILE	TEMP	40Ar	39Ar	38Ar	37Ar	36Ar ä regression	TRAP CURRENT	MANIFOLD OPTION
34690	1025	813795	39460	2265	42868	189	200	EALL
	▪	544	21	5	61	7		
34691	1050	344829	15593	1010	24462	109	200	EALL
	▪	157	11	21	41	6		
34692	1075	435555	20224	1332	31045	126	200	EALL
	▪	248	15	9	33	3		
34693	1100	1149117	57084	3606	107573	272	200	EALL
	▪	1175	82	8	201	6		
34694	1125	3564822	178039	11999	238745	480	200	EALL
	▪	2329	153	9	150	3		
34695	1150	1753684	89685	6444	85432	191	200	EALL
	▪	701	47	6	106	7		
34696	1175	564200	27088	1944	30992	110	200	EALL
	▪	176	26	22	42	8		
34697	1200	1141019	54528	3884	64924	158	200	EALL
	▪	620	46	8	108	7		
34698	1250	2527931	121751	8842	131345	286	200	EALL
	▪	1171	77	9	104	7		
34699	1350	264633	12401	813	16244	40	200	EALL
	▪	97	8	13	9	5		

C O R R E C T I O N S

TEMP C	39Ar Decay	37Ar Decay	-----K-derived---- 40Ar	38Ar	37Ar	----Ca-derived---- 39Ar	38Ar	36Ar	Cl-der 36Ar	Initial 38Ar
1025	24	192183	224	527	0	159	7	62	0	24
1050	9	109726	88	208	0	91	4	36	0	14
1075	12	139331	114	270	0	115	5	45	0	15
1100	34	483045	322	761	0	398	19	156	0	22
1125	107	1072633	1008	2377	0	885	42	347	2	25
1150	54	384033	508	1199	0	317	15	124	1	12
1175	16	139389	153	362	0	115	5	45	0	12
1200	33	292160	309	729	0	241	11	95	1	12
1250	74	591372	690	1627	0	488	23	191	1	18
1350	7	73177	70	166	0	60	3	24	0	3

All values in counts, corrected for mass discrimination

TEMP C	% TOT 39Ar	RAD YIELD	APP K/Ca	APP K/Cl	F	AGE (Ma)	precision intra-sample	precision intra-package	precision inter-package
A 1025	6.4	95.4	.09	54	19.716	302.30 ▪	.75	1.59	2.11
B 1050	2.5	93.7	.06	46	20.808	317.65 ▪	1.51	2.11	2.56
C 1075	3.3	94.5	.06	45	20.436	312.44 ▪	.57	1.55	2.11
D 1100	9.2	97.0	.05	48	19.632	301.12 ▪	.56	1.50	2.05
E 1125	28.9	98.9	.07	45	19.867	304.43 ▪	.20	1.42	2.00
F 1150	14.6	98.9	.10	41	19.370	297.41 ▪	.34	1.42	1.97
G 1175	4.4	96.6	.08	41	20.170	308.71 ▪	1.22	1.87	2.35
H 1200	8.9	98.4	.08	42	20.638	315.28 ▪	.52	1.54	2.12
I 1250	19.8	98.9	.09	41	20.581	314.47 ▪	.27	1.47	2.06
J 1350	2.0	98.2	.07	46	21.023	320.66 ▪	1.83	2.35	2.77
Total gas K/Ca =			.1						

Precisions are 1 sigma, measured in Ma. Measured 40/36 atm = 296.5 ▪.5
J = 0.009253 ▪ 0.50% (intra-package) ▪ 0.50% (inter-package)
Trap current factors- 40: 5.66 100: 2.26 200: 1
Manifold factors- ALL: 1 SPLIT 1: 3.3 SPLIT 2: 10.89 SPLIT 3: 35.937
EALL: 2.07 ESPLIT 1: 6.6 ESPLIT 2: 21.78
Sensitivity = 1.475E-17 % Reproducibility = .25 Detection limit = 40 counts
Data reduced assuming initial 40/36 = 295.50 ▪ 0.00
Ca-factors: 3637=2.6E-04▪1.7E-06 3837=3.2E-05▪2.4E-07 3937=6.7E-04▪3.7E-06
K-factors: 3739=0.0E+00▪2.2E-03 3839=1.3E-02▪2.4E-04 4039=5.7E-03▪4.0E-03

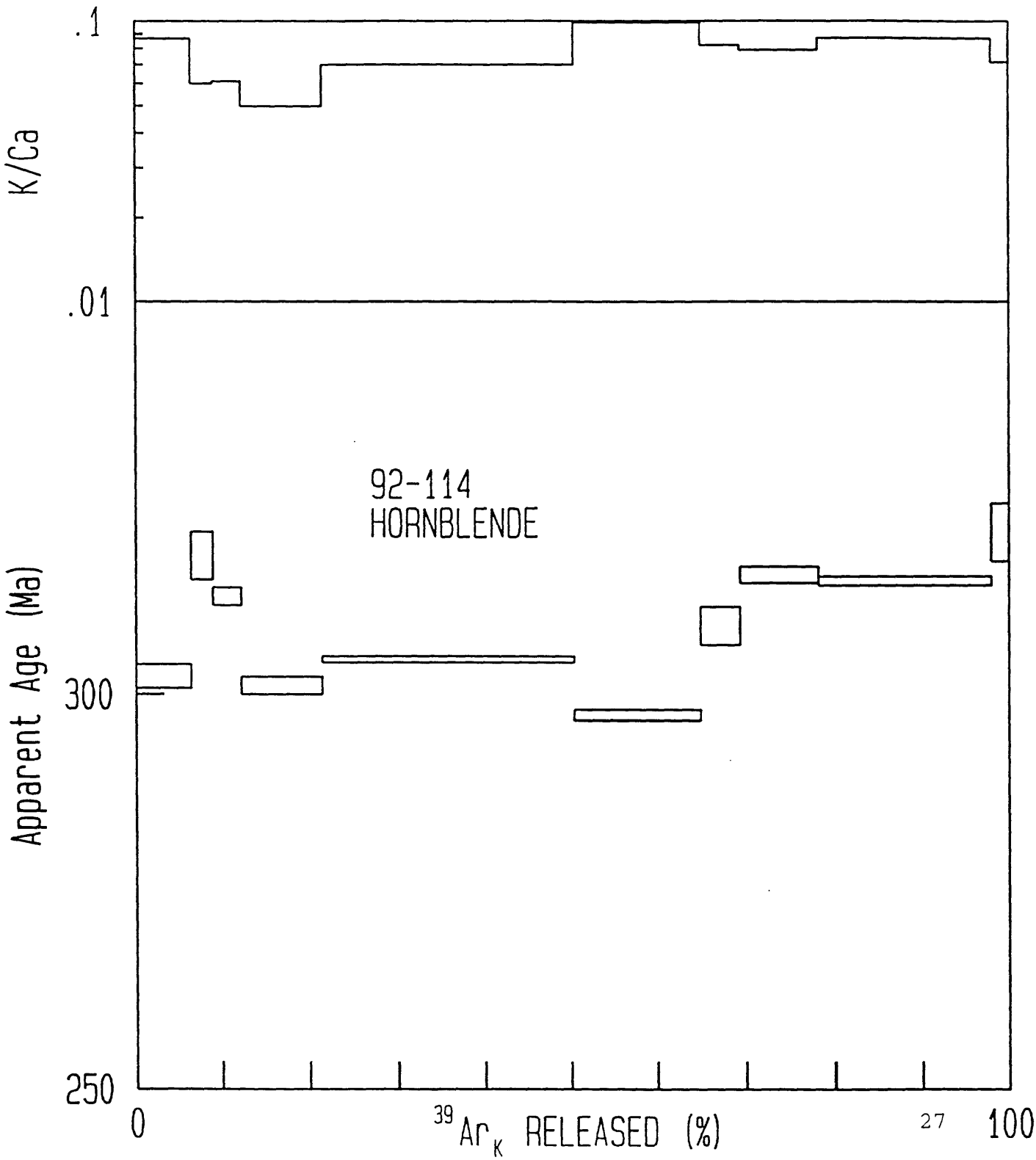
J = 0.009253 ▪ 0.50% SAMPLE WT = 1.0003 g

TEMP C	Initial & radiogenic 40Ar	Potassium derived 39Ar	Chlorine derived 38Ar	Calcium derived 37Ar	Initial 36Ar	AGE* in Ma	**
1025	2.484E-11	1.202E-12	5.368E-14	7.195E-12	3.883E-15	302.30 ▪	.75
1050	1.053E-11	4.740E-13	2.483E-14	4.108E-12	2.241E-15	317.65 ▪	1.51
1075	1.330E-11	6.149E-13	3.280E-14	5.215E-12	2.468E-15	312.44 ▪	.57
1100	3.508E-11	1.733E-12	8.714E-14	1.808E-11	3.544E-15	301.12 ▪	.56
1125	1.088E-10	5.417E-12	2.939E-13	4.014E-11	4.049E-15	304.43 ▪	.20
1150	5.353E-11	2.733E-12	1.604E-13	1.437E-11	2.028E-15	297.41 ▪	.34
1175	1.722E-11	8.248E-13	4.860E-14	5.215E-12	1.983E-15	308.71 ▪	1.22
1200	3.483E-11	1.660E-12	9.657E-14	1.093E-11	1.932E-15	315.28 ▪	.52
1250	7.716E-11	3.708E-12	2.206E-13	2.212E-11	2.886E-15	314.47 ▪	.27
1350	8.078E-12	3.773E-13	1.981E-14	2.737E-12	***	320.66 ▪	1.83
TOTAL GAS	3.834E-10	1.874E-11	1.038E-12	1.301E-10	2.551E-14	307.03	

NO PLATEAU

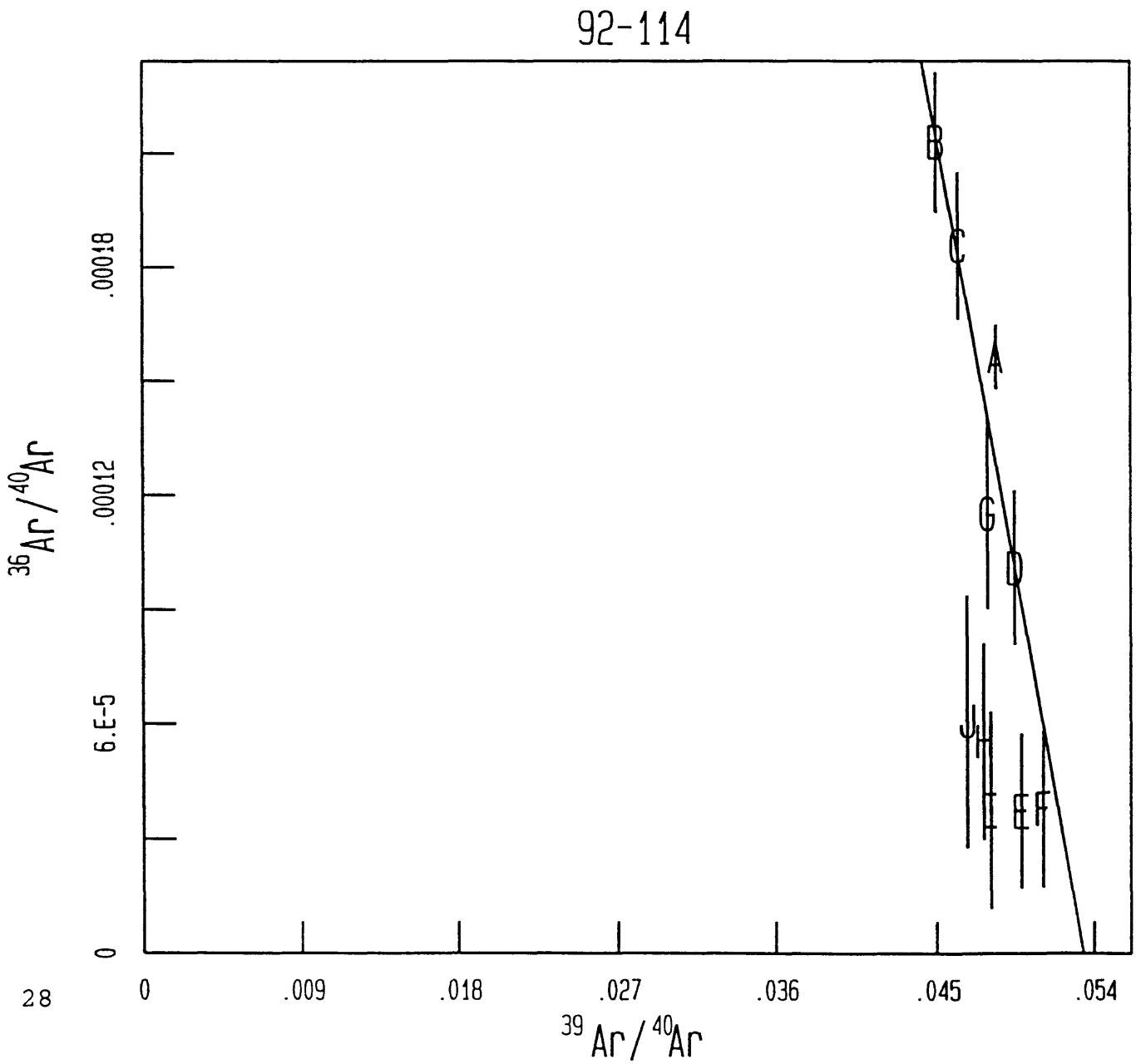
Note: all gas quantities are in moles. No blank correction.
* Ages calculated assuming initial 40Ar/36Ar = 295.5 ▪ 0
** 1-sigma precision estimates are for intra-sample reproducibility.
** 1-sigma precision estimates for plateaux are for intra-irradiation package reproducibility.
*** below detection limit

v 06/13/92 01:33:04 19 Jan 1993 92-114 #26,27,28,29 RD91



v 06/13/92 (40/36in = 295.5)

v 06/13/92 02:33:32 19 Jan 1993 92-114 #26,27,28,29 RD91
Points AEFGHIJ deleted;
 3 points regressed out of 10 includes 15.1 % of 39Ar
Mean X = .468E-01 Mean Y = .170E-03 Slope = -.257E-01 ä+Ç .615E-02
36/40 = .137E-02 ä+Ç .288E-03 39/40 = .534E-01 ä+Ç .164E-02
Fit parameters: SUMS = .024 MSWD = .024
40Ar/36Ar = 728.16 ä+Ç 152.48 F = 18.737 ä+Ç .575 AGE = 288.43 ä+Ç 8.28 Ma



W/O POINTS AEFGHIJ

v 06/13/92 92-115 #45 RD91 03:27:07 21 Jan 1993

R A W D A T A

FILE	TEMP	40Ar	39Ar	38Ar	37Ar	36Ar ä regression	TRAP CURRENT	MANIFOLD OPTION
34789	1100	2827809	108473	3553	240601	1705	200	EALL
	▪	1180	55	11	133	13		
34790	1125	2172369	94858	2886	202106	972	200	EALL
	▪	4830	233	20	418	5		
34791	1225	1471417	58614	1886	126292	994	200	EALL
	▪	2937	89	6	203	9		
34792	1350	851101	31925	1058	70131	740	200	EALL
	▪	239	12	14	42	4		
34793	1650	671048	21865	778	48188	811	200	EALL
	▪	649	45	5	69	4		

C O R R E C T I O N S

TEMP C	39Ar Decay	37Ar Decay	-----K-derived---- 40Ar	38Ar	37Ar	----Ca-derived---- 39Ar	38Ar	36Ar	Cl-der 36Ar	Initial 38Ar
1100	69	1191670	612	1443	0	966	46	379	0	249
1125	60	1001539	535	1262	0	812	38	319	0	123
1225	37	626171	331	780	0	508	24	199	0	149
1350	20	347900	180	425	0	282	13	111	0	118
1650	14	239174	123	291	0	194	9	76	0	138

All values in counts, corrected for mass discrimination

	TEMP C	% TOT 39Ar	RAD YIELD	APP K/Ca	APP K/Cl	F	AGE (Ma)	precision intra-sample	precision intra-package	precision inter-package
A	1100	34.4	86.1	.04	112	22.606	351.99 ▪	.53	1.70	2.34
B	1125	30.0	91.1	.04	133	21.000	329.13 ▪	.76	1.70	2.27
C	1225	18.6	84.0	.04	114	21.228	332.40 ▪	.96	1.81	2.37
D	1350	10.1	78.1	.04	104	20.959	328.55 ▪	.60	1.64	2.23
E	1650	6.9	67.5	.04	85	20.864	327.19 ▪	.93	1.80	2.34

Total gas K/Ca = 0.0

Precisions are 1 sigma, measured in Ma. Measured 40/36 atm = 296.5 ▪.5
J = 0.009531 ▪ 0.50% (intra-package) ▪ 0.50% (inter-package)
Trap current factors- 40: 5.66 100: 2.26 200: 1
Manifold factors- ALL: 1 SPLIT 1: 3.3 SPLIT 2: 10.89 SPLIT 3: 35.937
EALL: 2.1167 ESPLIT 1: 6.6 ESPLIT 2: 21.78
Sensitivity = 1.475E-17 % Reproducibility = .25 Detection limit = 40 counts
Data reduced assuming initial 40/36 = 295.50 ▪ 0.00
Ca-factors: 3637=2.6E-04▪1.7E-06 3837=3.2E-05▪2.4E-07 3937=6.7E-04▪3.7E-06
K-factors: 3739=0.0E+00▪2.2E-03 3839=1.3E-02▪2.4E-04 4039=5.7E-03▪4.0E-03

v 06/13/92 03:27:11 21 Jan 1993

92-115 #45 RD91

J = 0.009531 ▪ 0.50% SAMPLE WT = 0.0997 g

TEMP C	Initial & radiogenic 40Ar	Potassium derived 39Ar	Chlorine derived 38Ar	Calcium derived 37Ar	Initial 36Ar	AGE* in Ma	**
1100	8.827E-11	3.362E-12	7.244E-14	4.483E-11	4.156E-14	351.99 ▪	.53
1125	6.781E-11	2.941E-12	5.348E-14	3.767E-11	2.049E-14	329.13 ▪	.76
1225	4.593E-11	1.817E-12	3.856E-14	2.355E-11	2.491E-14	332.40 ▪	.96
1350	2.657E-11	9.894E-13	2.310E-14	1.308E-11	1.973E-14	328.55 ▪	.60
1650	2.095E-11	6.776E-13	1.927E-14	8.995E-12	2.304E-14	327.19 ▪	.93
TOTAL GAS	2.495E-10	9.786E-12	2.068E-13	1.281E-10	1.297E-13	337.43	

NO PLATEAU

Note: all gas quantities are in moles. No blank correction.

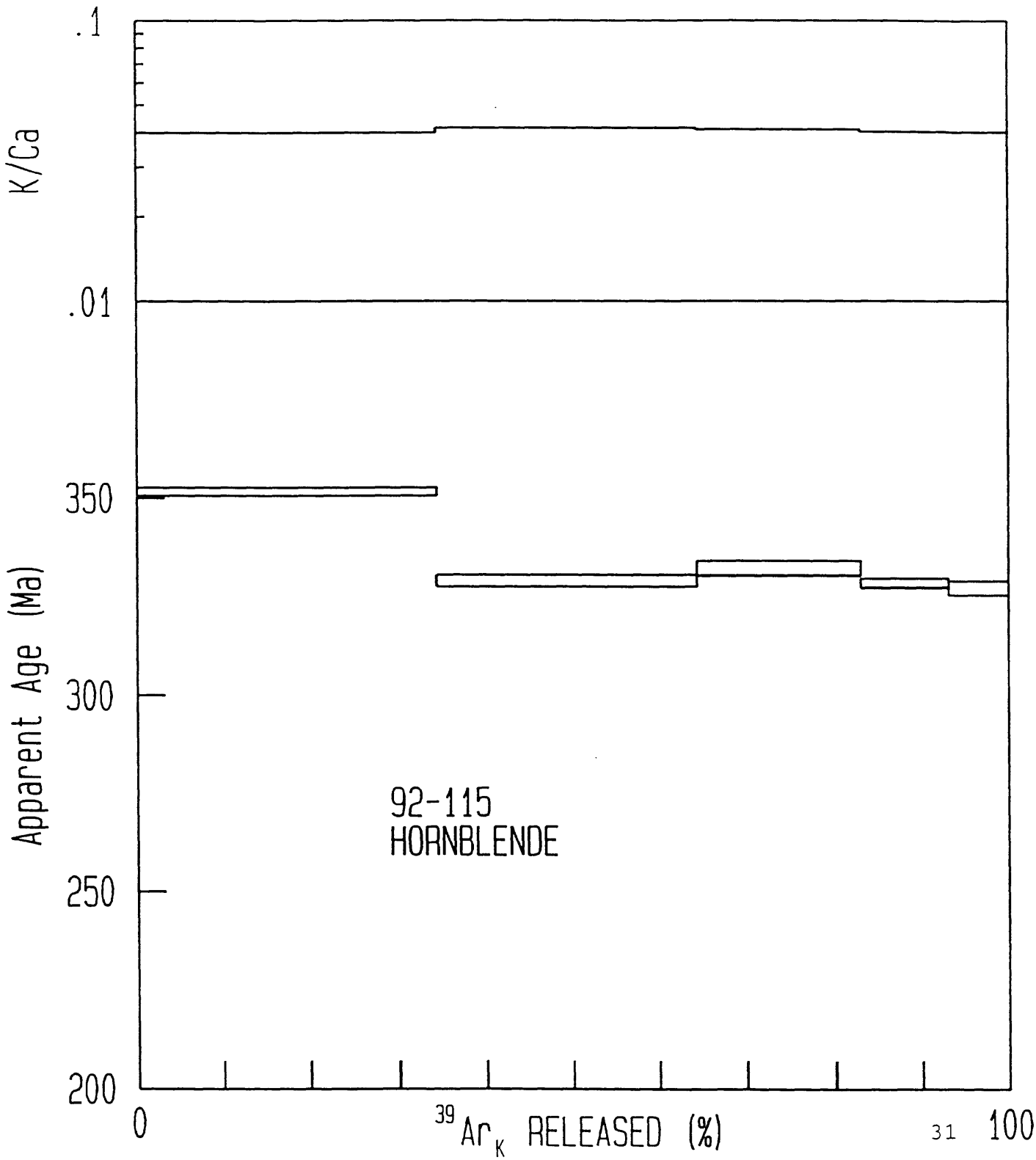
* Ages calculated assuming initial 40Ar/36Ar = 295.5 ▪ 0

** 1-sigma precision estimates are for intra-sample reproducibility.

** 1-sigma precision estimates for plateaux are for intra-irradiation package reproducibility.

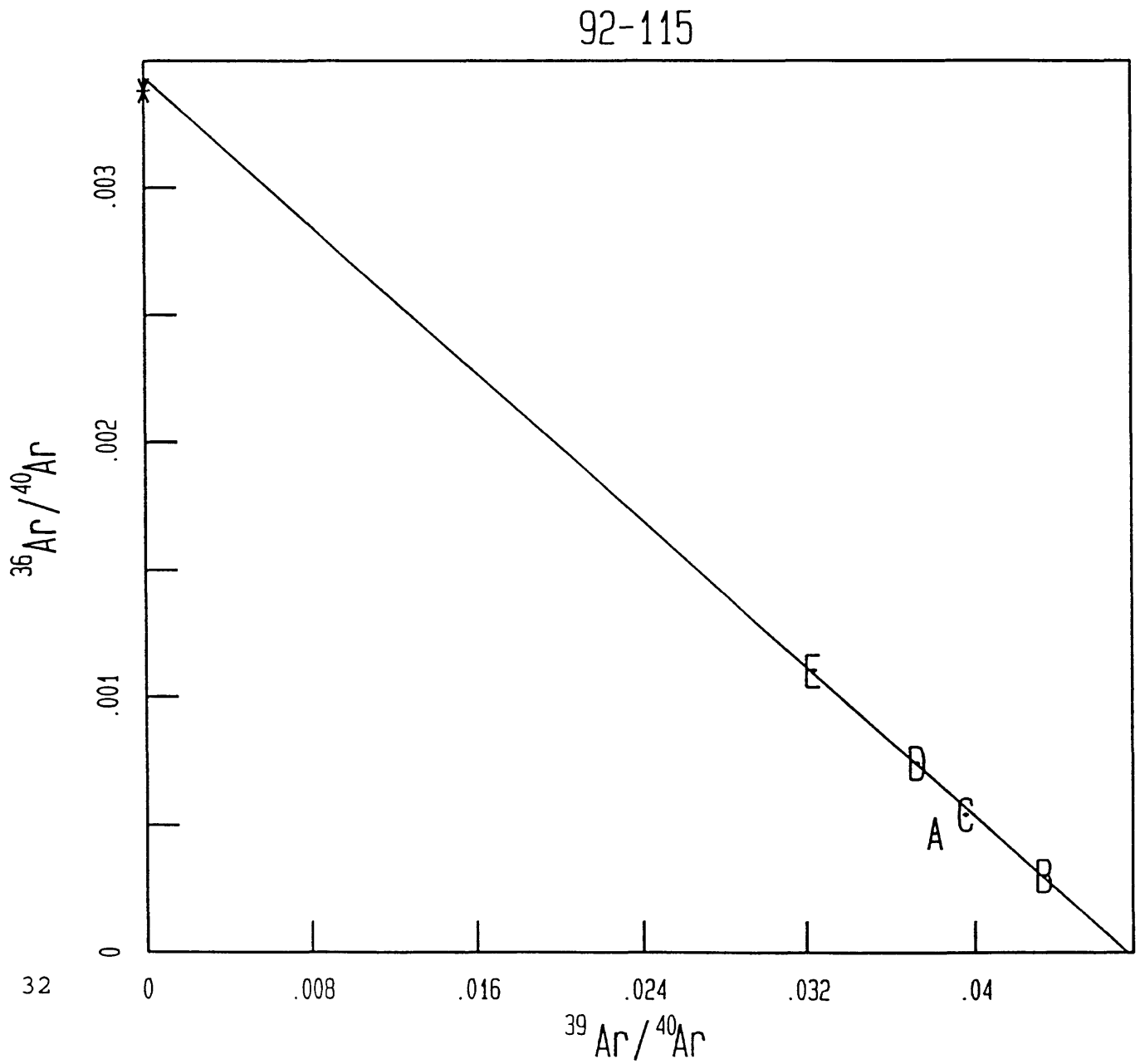
*** below detection limit

v 06/13/92


.1
K/Ca
.01
350
Apparent Age (Ma)
300
92-115
HORNBLENDE
250
200
0
39Ar K RELEASED (%)
31
100

v 06/13/92 03:30:58 21 Jan 1993 92-115 #45 RD91

Point A deleted;
4 points regressed out of 5 includes 65.6 % of 39Ar
Mean X = .395E-01 Mean Y = .573E-03 Slope = -.724E-01 ä+Ç .152E-02
36/40 = .344E-02 ä+Ç .604E-04 39/40 = .474E-01 ä+Ç .185E-03
Fit parameters: SUMS = 6.029 MSWD = 3.014
40Ar/36Ar = 291.1 ä+Ç 5.11 F = 21.089 ä+Ç .082 AGE = 330.41 ä+Ç 1.92 Ma



W/O POINTS A

v 06/13/92 92-116 #52 RD91 06:19:14 23 Jan 1993

R A W D A T A

FILE	TEMP	40Ar	39Ar	38Ar	37Ar	36Ar ä regression	TRAP CURRENT	MANIFOLD OPTION
34846	1450	2794251	163657	3486	72	200	40	EALL
	▪	2067	60	7	8	6		

C O R R E C T I O N S

TEMP C	39Ar Decay	37Ar Decay	K-derived 40Ar	K-derived 38Ar	K-derived 37Ar	Ca-derived 39Ar	Ca-derived 38Ar	Ca-derived 36Ar	Cl-der 36Ar	Initial 38Ar
1450	105	363	931	2196	0	0	0	0	0	37

All values in counts, corrected for mass discrimination

TEMP C	% TOT 39Ar	RAD YIELD	APP K/Ca	APP K/Cl	F	AGE (Ma)	precision intra-sample	precision intra-package	precision inter-package
A 1450	100.0	97.9	195.49	297	16.682	259.17 ▪	.23	1.23	1.73
Total gas K/Ca =			195.5						

Precisions are 1 sigma, measured in Ma. Measured 40/36 atm = 296.5 ▪.5
J = 0.009261 ▪ 0.50% (intra-package) ▪ 0.50% (inter-package)
Trap current factors- 40: 2.26 100: 2.26 200: 1
Manifold factors- ALL: 1 SPLIT 1: 3.67 SPLIT 2: 10.89 SPLIT 3: 35.937
EALL: 2.1167 ESPLIT 1: 7.77 ESPLIT 2: 21.78
Sensitivity = 1.475E-17 % Reproducibility = .25 Detection limit = 40 counts
Data reduced assuming initial 40/36 = 295.50 ▪ 0.00
Ca-factors: 3637=2.6E-04▪1.7E-06 3837=3.2E-05▪2.4E-07 3937=6.7E-04▪3.7E-06
K-factors: 3739=0.0E+00▪2.2E-03 3839=1.3E-02▪2.4E-04 4039=5.7E-03▪4.0E-03

J = 0.009261 ▪ 0.50% SAMPLE WT = 0.0498 g

TEMP C	Initial & radiogenic 40Ar	Potassium derived 39Ar	Chlorine derived 38Ar	Calcium derived 37Ar	Initial 36Ar	AGE* in Ma	**
1450	1.971E-10	1.156E-11	9.409E-14	3.076E-14	1.411E-14	259.17 ▪	.23

Note: all gas quantities are in moles. No blank correction.
* Ages calculated assuming initial 40Ar/36Ar = 295.5 ▪ 0
** 1-sigma precision estimates are for intra-sample reproducibility.
** 1-sigma precision estimates for plateaux are for intra-irradiation package reproducibility.
*** below detection limit

91-524 #24 RD87 MUSCOVITE 16:46:36 , 28 Aug 1992 32734

v 06/13/92 91-524 #24 MUSCOVITE RD87 15:19:04 28 Aug 1992

R A W D A T A

FILE	TEMP	40Ar	39Ar	38Ar	37Ar	36Ar regression	TRAP CURRENT	MANIFOLD OPTION
32723	900	185910	10521	73	28	42	200	EALL
	±	289	20	16	21	2		
32724	950	309367	17748	116	34	40	200	EALL
	±	205	9	10	17	6		
32725	1000	738525	41426	532	38	130	200	EALL
	±	1161	50	18	9	4		
32726	1050	2576420	148287	1914	0	234	200	EALL
	±	994	47	4	9	6		
32727	1100	4098421	244758	3093	4	135	200	EALL
	±	5012	240	12	40	4		
32728	1150	1742376	103505	1330	110	97	200	EALL
	±	225	16	5	13	2		
32729	1200	1148447	66579	864	127	101	200	EALL
	±	1064	74	9	8	6		
32730	1250	1583996	93121	1193	88	77	200	EALL
	±	757	39	6	10	7		
32731	1450	1490464	88320	1131	1183	31	200	EALL
	±	716	40	18	8	7		

C O R R E C T I O N S

TEMP	39Ar	37Ar	-----K-derived----			----Ca-derived----			Cl-der	Initial
°C	Decay	Decay	40Ar	38Ar	37Ar	39Ar	38Ar	36Ar	36Ar	38Ar
900	3	30	60	141	0	0	0	0	-0	8
950	5	37	101	238	0	0	0	0	-0	8
1000	11	41	236	556	0	0	0	0	0	24
1050	38	0	843	1989	0	0	0	0	-0	44
1100	63	4	1392	3283	0	0	0	0	-0	25
1150	27	120	589	1388	0	0	0	0	-0	18
1200	17	138	379	893	0	0	0	0	-0	19
1250	24	95	530	1249	0	0	0	0	-0	14
1450	23	1286	502	1185	0	2	0	1	-0	6

All values in counts, corrected for mass discrimination

v 06/13/92 91-524 #24 MUSCOVITE RD87 15:19:06 28 Aug 1992

	TEMP C	% TOT 39Ar	RAD YIELD	APP K/Ca	APP K/Cl	F	AGE (Ma)	precision intra-sample	precision intra-package	precision inter-package
A	900	1.3	93.3	95.20	0	16.465	250.70 ±	.92	1.49	1.90
B	950	2.2	96.1	129.97	0	16.735	254.54 ±	1.35	1.80	2.16
C	1000	5.1	94.8	272.38	58107	16.872	256.48 ±	.57	1.33	1.79
D	1050	18.2	97.3	0.00	0	16.882	256.62 ±	.18	1.22	1.71
E	1100	30.1	99.0	15276.96	0	16.557	252.01 ±	.30	1.22	1.69
F	1150	12.7	98.4	233.84	0	16.532	251.66 ±	.09	1.18	1.67
G	1200	8.2	97.4	130.53	0	16.776	255.12 ±	.42	1.27	1.74
H	1250	11.4	98.6	263.77	0	16.740	254.61 ±	.35	1.24	1.72
I	1450	10.8	99.4	18.57	0	16.750	254.75 ±	.33	1.24	1.72

Total gas K/Ca =

Precisions are 1 sigma, measured in Ma. Measured 40/36 atm = 296.5 ±.5
J = 0.009055 ± 0.50% (intra-package) ± 0.50% (inter-package)
Trap current factors- 40: 5.66 100: 2.62 200: 1
Manifold factors- ALL: 1 SPLIT 1: 3.3 SPLIT 2: 10.89 SPLIT 3: 35.937
EALL: 2 ESPLIT 1: 6.6 ESPLIT 2: 21.78
Sensitivity = 1.000E-17 % Reproducibility = .25 Detection limit = 40 counts
Data reduced assuming initial 40/36 = 295.50 ± 0.00
Ca-factors: 3637=2.6E-04±1.7E-06 3837=3.2E-05±2.4E-07 3937=6.7E-04±3.7E-06
K-factors: 3739=0.0E+00±2.2E-03 3839=1.3E-02±2.4E-04 4039=5.7E-03±4.0E-03

J = 0.009055 ± 0.50% SAMPLE WT = 0.1020 g

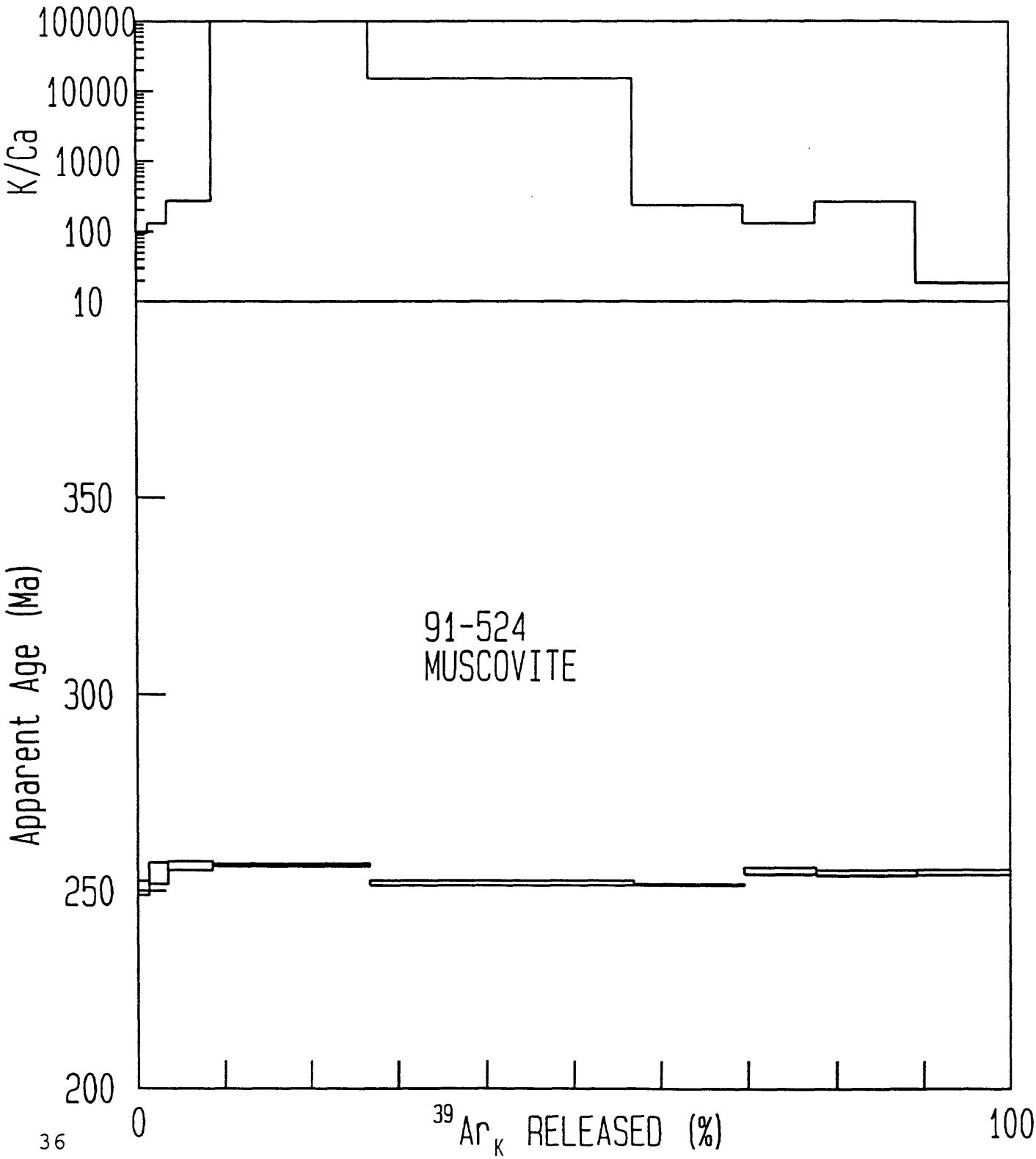
TEMP C	Initial & radiogenic 40Ar	Potassium derived 39Ar	Chlorine derived 38Ar	Calcium derived 37Ar	Initial 36Ar	AGE* in Ma	**
900	3.717E-12	2.106E-13	***	1.151E-15	8.419E-16	250.70 ±	.92
950	6.185E-12	3.553E-13	***	1.422E-15	8.073E-16	254.54 ±	1.35
1000	1.477E-11	8.294E-13	***	1.583E-15	2.613E-15	256.48 ±	.57
1050	5.151E-11	2.969E-12	***	***	4.699E-15	256.62 ±	.18
1100	8.194E-11	4.901E-12	***	***	2.719E-15	252.01 ±	.30
1150	3.484E-11	2.072E-12	***	4.609E-15	1.945E-15	251.66 ±	.09
1200	2.296E-11	1.333E-12	***	5.311E-15	2.022E-15	255.12 ±	.42
1250	3.167E-11	1.864E-12	***	3.676E-15	1.548E-15	254.61 ±	.35
1450	2.980E-11	1.768E-12	***	4.951E-14	***	254.75 ±	.33
TOTAL GAS	2.774E-10	1.630E-11	***	6.742E-14	1.780E-14	253.92	

NO PLATEAU

Note: all gas quantities are in moles. No blank correction.
* Ages calculated assuming initial 40Ar/36Ar = 295.5 ± 0
** 1-sigma precision estimates are for intra-sample reproducibility.
** 1-sigma precision estimates for plateaux are for intra-irradiation package reproducibility.
*** below detection limit

v 06/13/92

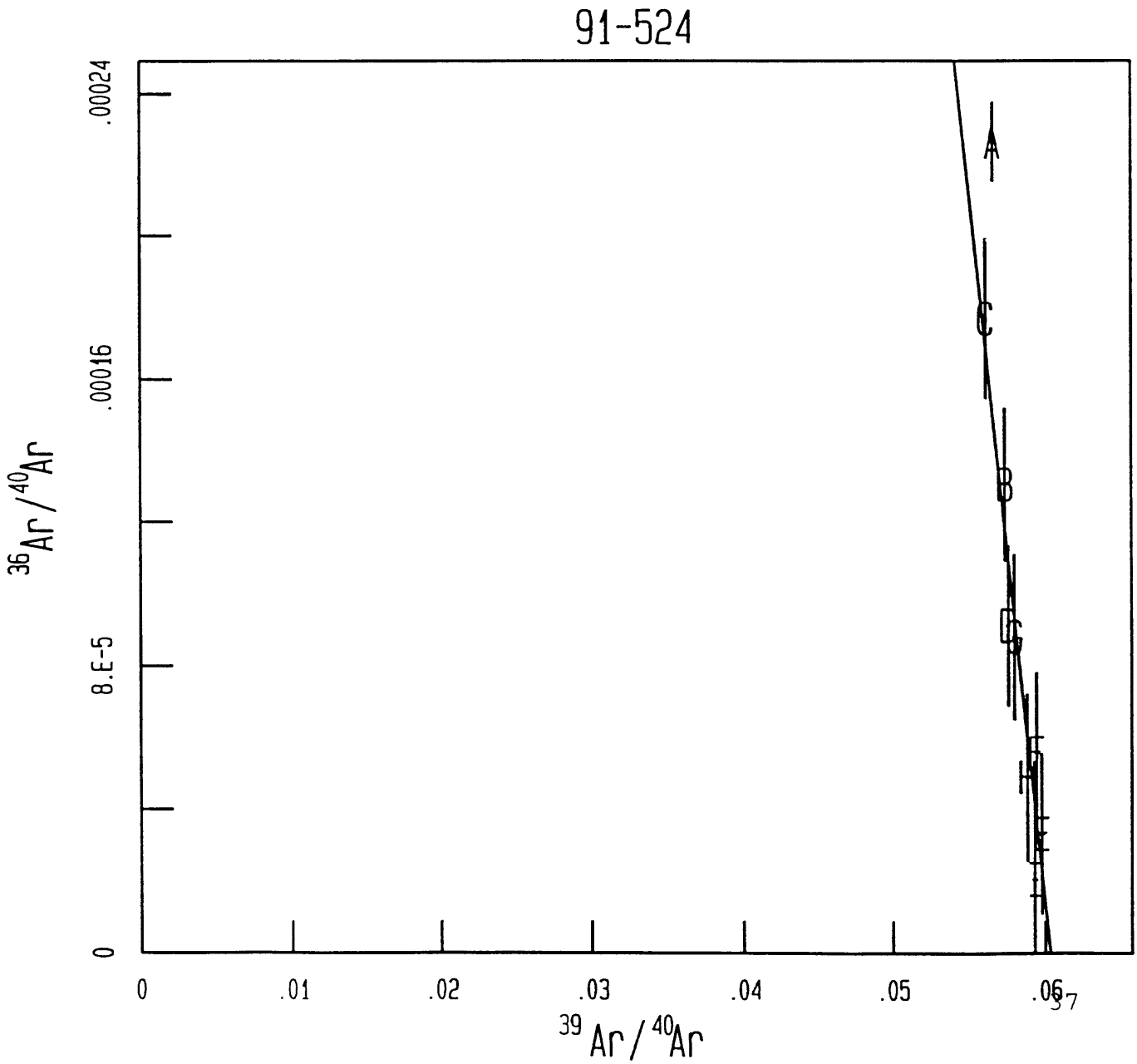
v 06/13/92 03:54:58 23 Jan 1993 91-524 #24 RD87



v 06/13/92 (40/36in = 295.5)

v 06/13/92 03:51:51 23 Jan 1993 91-524 #24 RD87

Point A deleted;
 8 points regressed out of 9 includes 98.7 % of 39Ar
Mean X = .583E-01 Mean Y = .830E-04 Slope = -.406E-01 ä+Ç .704E-02
36/40 = .245E-02 ä+Ç .410E-03 39/40 = .604E-01 ä+Ç .413E-03
Fit parameters: SUMS = 3.089 MSWD = .515
40Ar/36Ar = 408.28 ä+Ç 68.4 F = 16.568 ä+Ç .113 AGE = 252.17 ä+Ç 1.99 Ma



W/O POINTS A

R A W D A T A

FILE	TEMP	40Ar	39Ar	38Ar	37Ar	36Ar ä regression	TRAP CURRENT	MANIFOLD OPTION
30902	1050	488146	20979	2071	178499	209	200	EALL
	▪	999	49	12	105	6		
30903	1075	2154533	100781	9724	832910	695	200	EALL
	▪	3200	121	10	672	10		
30904	1100	1510772	70897	6886	581766	503	200	EALL
	▪	1066	66	14	718	10		
30905	1125	241254	10964	1047	88782	113	200	EALL
	▪	94	14	11	121	3		
30906	1150	190329	8603	884	69088	122	200	EALL
	▪	44	13	14	40	2		
30907	1175	396287	18156	1768	146558	184	200	EALL
	▪	220	18	6	60	3		
30908	1200	159483	7091	697	57054	98	200	EALL
	▪	18	12	3	4	3		
30909	1250	204505	9402	919	74111	99	200	EALL
	▪	78	13	13	75	10		

C O R R E C T I O N S

TEMP C	39Ar Decay	37Ar Decay	-----K-derived---- 40Ar	38Ar	37Ar	----Ca-derived---- 39Ar	38Ar	36Ar	Cl-der 36Ar	Initial 38Ar
1050	6	252927	118	278	0	291	14	114	0	18
1075	30	1181280	565	1334	0	1359	64	533	1	31
1100	21	825865	398	938	0	950	45	373	0	25
1125	3	126148	62	145	0	145	7	57	0	11
1150	3	98255	48	114	0	113	5	44	0	15
1175	5	208621	102	240	0	240	11	94	0	17
1200	2	81291	40	94	0	93	4	37	0	12
1250	3	105689	53	125	0	121	6	48	0	10

All values in counts, corrected for mass discrimination

TEMP C	% TOT 39Ar	RAD YIELD	APP K/Ca	APP K/Cl	F	AGE (Ma)	precision intra-sample	precision intra-package	precision inter-package
A 1050	8.5	94.2	.02	28	22.207	339.13 ▪	1.43	2.11	2.62
B 1075	40.8	97.8	.03	29	21.155	324.43 ▪	.60	1.61	2.20
C 1100	28.7	97.4	.03	29	21.013	322.44 ▪	.66	1.62	2.20
D 1125	4.4	93.1	.03	29	20.727	318.41 ▪	1.14	1.86	2.37
E 1150	3.5	87.9	.03	26	19.687	303.71 ▪	.98	1.71	2.22
F 1175	7.4	93.3	.03	28	20.604	316.68 ▪	.73	1.63	2.19
G 1200	2.9	88.5	.03	28	20.139	310.12 ▪	2.07	2.52	2.90
H 1250	3.8	92.6	.03	28	20.367	313.34 ▪	4.29	4.53	4.76
Total gas K/Ca =			0.0						

Precisions are 1 sigma, measured in Ma. Measured 40/36 atm = 296.5 ▪.5
J = 0.009313 ▪ 0.50% (intra-package) ▪ 0.50% (inter-package)
Trap current factors- 40: 5.66 100: 2.26 200: 1
Manifold factors- ALL: 1 SPLIT 1: 4.2 SPLIT 2: 10.89 SPLIT 3: 35.937
EALL: 2 ESPLIT 1: 6.6 ESPLIT 2: 21.78
Sensitivity = 1.344E-17 % Reproducibility = .25 Detection limit = 40 counts
Data reduced assuming initial 40/36 = 295.50 ▪ 0.00
Ca-factors: 3637=2.6E-04▪1.7E-06 3837=3.2E-05▪2.4E-07 3937=6.7E-04▪3.7E-06
K-factors: 3739=0.0E+00▪2.2E-03 3839=1.3E-02▪2.4E-04 4039=5.7E-03▪4.0E-03

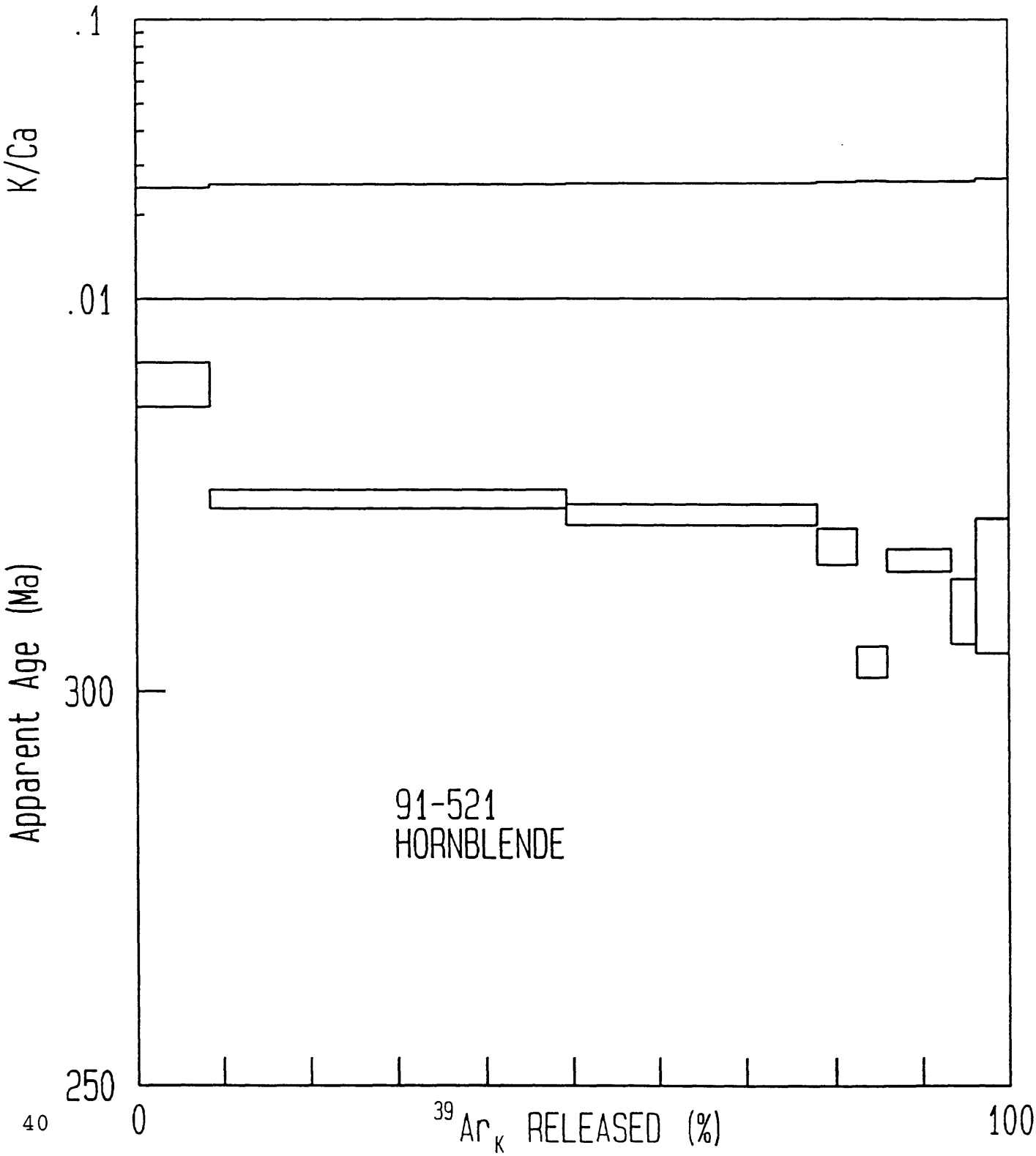
J = 0.009313 ▪ 0.50% SAMPLE WT = 1.0017 g

TEMP C	Initial & radiogenic 40Ar	Potassium derived 39Ar	Chlorine derived 38Ar	Calcium derived 37Ar	Initial 36Ar	AGE* in Ma	**
1050	1.312E-11	5.567E-13	4.842E-14	1.163E-11	2.555E-15	339.13 ▪	1.43
1075	5.790E-11	2.676E-12	2.251E-13	5.428E-11	4.391E-15	324.43 ▪	.60
1100	4.060E-11	1.882E-12	1.596E-13	3.793E-11	3.536E-15	322.44 ▪	.66
1125	6.483E-12	2.912E-13	2.439E-14	5.792E-12	1.518E-15	318.41 ▪	1.14
1150	5.115E-12	2.285E-13	2.099E-14	4.510E-12	2.087E-15	303.71 ▪	.98
1175	1.065E-11	4.821E-13	4.129E-14	9.571E-12	2.421E-15	316.68 ▪	.73
1200	4.286E-12	1.883E-13	1.645E-14	3.728E-12	1.670E-15	310.12 ▪	2.07
1250	5.496E-12	2.497E-13	2.150E-14	4.845E-12	1.384E-15	313.34 ▪	4.29
TOTAL GAS	1.436E-10	6.554E-12	5.577E-13	1.323E-10	1.956E-14	322.73	

69.5% of gas on plateau, steps 1075 through 1100 PLATEAU AGE = 323.52 + 1.66

Note: all gas quantities are in moles. No blank correction.
* Ages calculated assuming initial 40Ar/36Ar = 295.5 ▪ 0
** 1-sigma precision estimates are for intra-sample reproducibility.
** 1-sigma precision estimates for plateaux are for intra-irradiation package reproducibility.
*** below detection limit

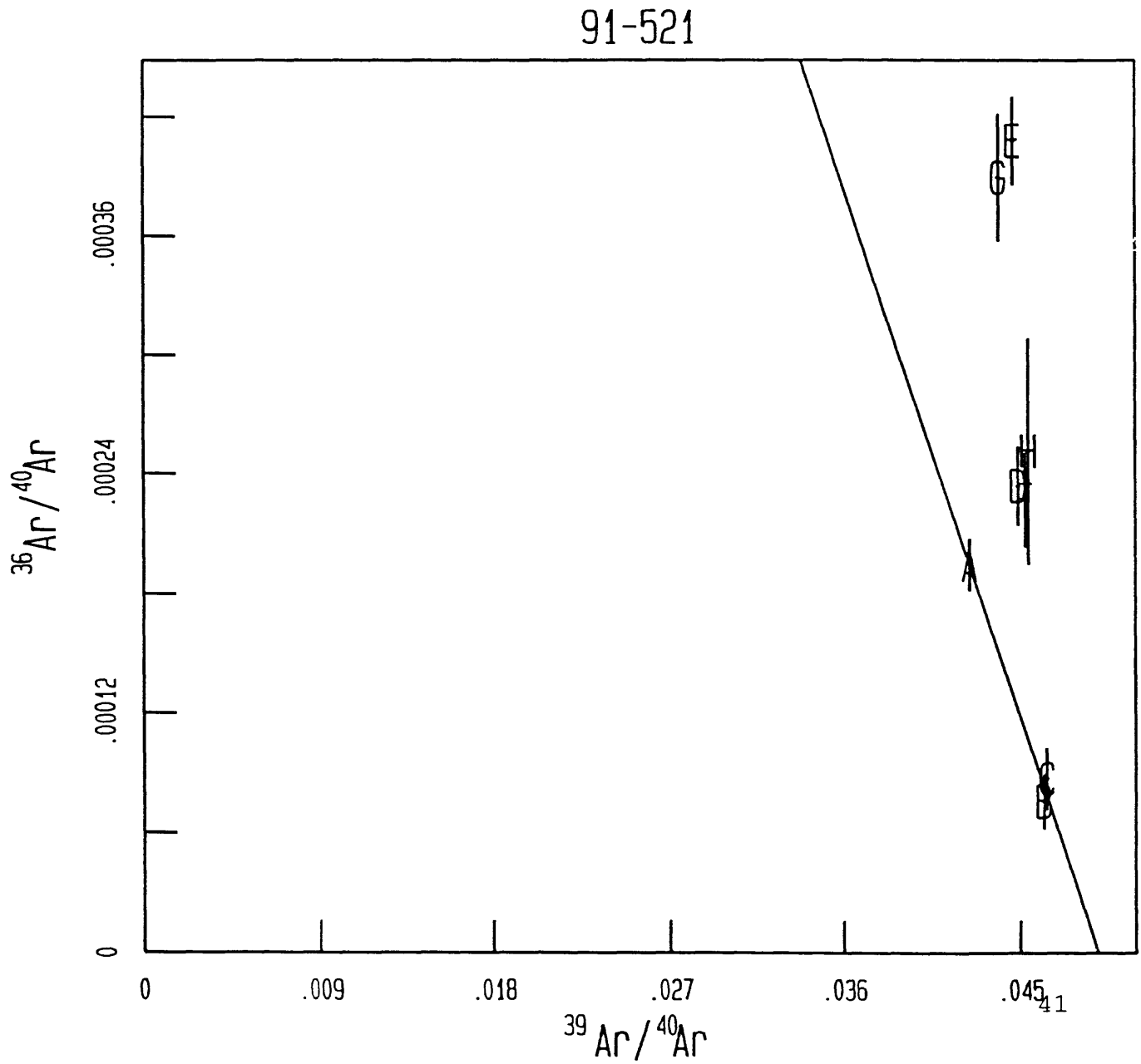
v 06/13/92 00:08:04 23 Jan 1993 91-521 #91,92,93 RD85



v 06/13/92 (40/36in = 295.5)

v 06/13/92 00:14:33 23 Jan 1993 91-521 #91,92,93 RD85

Points DEFGH deleted;
 3 points regressed out of 8 includes 78 % of 39Ar
Mean X = .448E-01 Mean Y = .125E-03 Slope = -.296E-01 ä+Ç .443E-02
36/40 = .145E-02 ä+Ç .199E-03 39/40 = .490E-01 ä+Ç .691E-03
Fit parameters: SUMS = .554 MSWD = .554
40Ar/36Ar = 689.77 ä+Ç 94.48 F = 20.401 ä+Ç .288 AGE = 313.82 ä+Ç 4.31 Ma



W/O POINTS DEFGH

R A W D A T A

FILE	TEMP	40Ar	39Ar	38Ar	37Ar	36Ar ä regression	TRAP CURRENT	MANIFOLD OPTION
30881	1050	377685	15800	2739	48215	78	200	EALL
	▪	292	11	9	65	5		
30882	1100	1606668	69260	12387	181696	161	200	ESPLIT
	▪	756	27	12	234	3		
30883	1125	3010216	129500	22730	327550	270	200	EALL
	▪	4916	66	26	624	5		
30884	1140	1040101	45202	7693	107934	92	200	EALL
	▪	396	15	14	122	10		
30885	1160	290199	12839	2132	31297	35	200	EALL
	▪	50	9	10	27	5		
30886	1175	250691	11225	1923	28160	45	200	EALL
	▪	97	9	8	30	2		
30887	1200	341239	15194	2600	38108	40	200	EALL
	▪	160	13	14	24	3		

C O R R E C T I O N S

TEMP |C	39Ar Decay	37Ar Decay	-----K-derived---- 40Ar	38Ar	37Ar	----Ca-derived---- 39Ar	38Ar	36Ar	Cl-der 36Ar	Initial 38Ar
1050	5	66693	89	211	0	78	4	30	0	9
1100	20	251606	392	925	0	292	14	115	1	9
1125	37	454006	733	1730	0	527	25	207	2	12
1140	13	149742	256	604	0	174	8	68	1	4
1160	4	43460	73	172	0	50	2	20	0	3
1175	3	39139	64	150	0	45	2	18	0	5
1200	4	53015	86	203	0	61	3	24	0	3

All values in counts, corrected for mass discrimination

TEMP C	% TOT 39Ar	RAD YIELD	APP K/Ca	APP K/Cl	F	AGE (Ma)	precision intra-sample	precision intra-package	precision inter-package
A 1050	3.4	96.3	.07	15	23.100	346.04 ▪	1.36	2.09	2.61
B 1100	49.9	99.2	.08	15	23.067	345.59 ▪	.22	1.59	2.24
C 1125	28.3	99.4	.09	15	23.165	346.92 ▪	.55	1.68	2.30
D 1140	9.9	99.3	.09	15	22.914	343.50 ▪	.87	1.80	2.38
E 1160	2.8	98.5	.09	16	22.319	335.37 ▪	1.59	2.21	2.69
F 1175	2.4	96.8	.09	15	21.672	326.47 ▪	.59	1.61	2.20
G 1200	3.3	98.6	.09	15	22.205	333.79 ▪	.92	1.78	2.35
Total gas K/Ca =			.1						

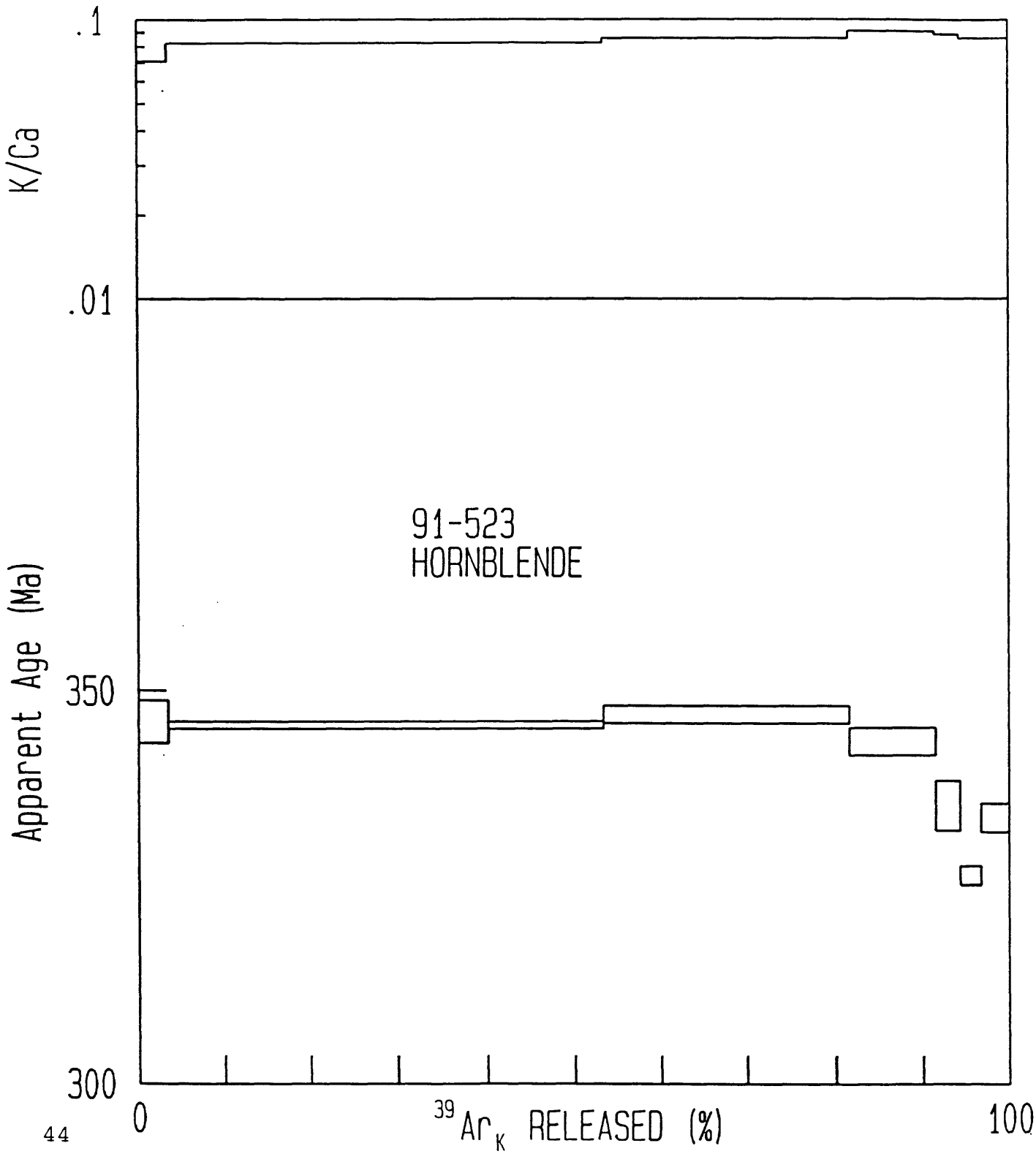
Precisions are 1 sigma, measured in Ma. Measured 40/36 atm = 296.5 ▪.5
J = 0.009154 ▪ 0.50% (intra-package) ▪ 0.50% (inter-package)
Trap current factors- 40: 5.66 100: 2.26 200: 1
Manifold factors- ALL: 1 SPLIT 1: 4.2 SPLIT 2: 10.89 SPLIT 3: 35.937
EALL: 2 ESPLIT 1: 6.6 ESPLIT 2: 21.78
Sensitivity = 1.344E-17 % Reproducibility = .25 Detection limit = 40 counts
Data reduced assuming initial 40/36 = 295.50 ▪ 0.00
Ca-factors: 3637=2.6E-04▪1.7E-06 3837=3.2E-05▪2.4E-07 3937=6.7E-04▪3.7E-06
K-factors: 3739=0.0E+00▪2.2E-03 3839=1.3E-02▪2.4E-04 4039=5.7E-03▪4.0E-03

J = 0.009154 ▪ 0.50% SAMPLE WT = 0.6662 g

TEMP C	Initial & radiogenic 40Ar	Potassium derived 39Ar	Chlorine derived 38Ar	Calcium derived 37Ar	Initial 36Ar	AGE* in Ma	**
1050	1.015E-11	4.231E-13	6.823E-14	3.097E-12	1.272E-15	346.04 ▪	1.36
1100	1.425E-10	6.125E-12	1.018E-12	3.853E-11	4.081E-15	345.59 ▪	.22
1125	8.089E-11	3.471E-12	5.652E-13	2.106E-11	1.679E-15	346.92 ▪	.55
1140	2.795E-11	1.212E-12	1.908E-13	6.944E-12	***	343.50 ▪	.87
1160	7.799E-12	3.441E-13	5.280E-14	2.015E-12	***	335.37 ▪	1.59
1175	6.737E-12	3.008E-13	4.784E-14	1.814E-12	***	326.47 ▪	.59
1200	9.170E-12	4.072E-13	6.456E-14	2.456E-12	***	333.79 ▪	.92
TOTAL GAS	2.852E-10	1.228E-11	2.008E-12	7.592E-11	9.226E-15	344.63	

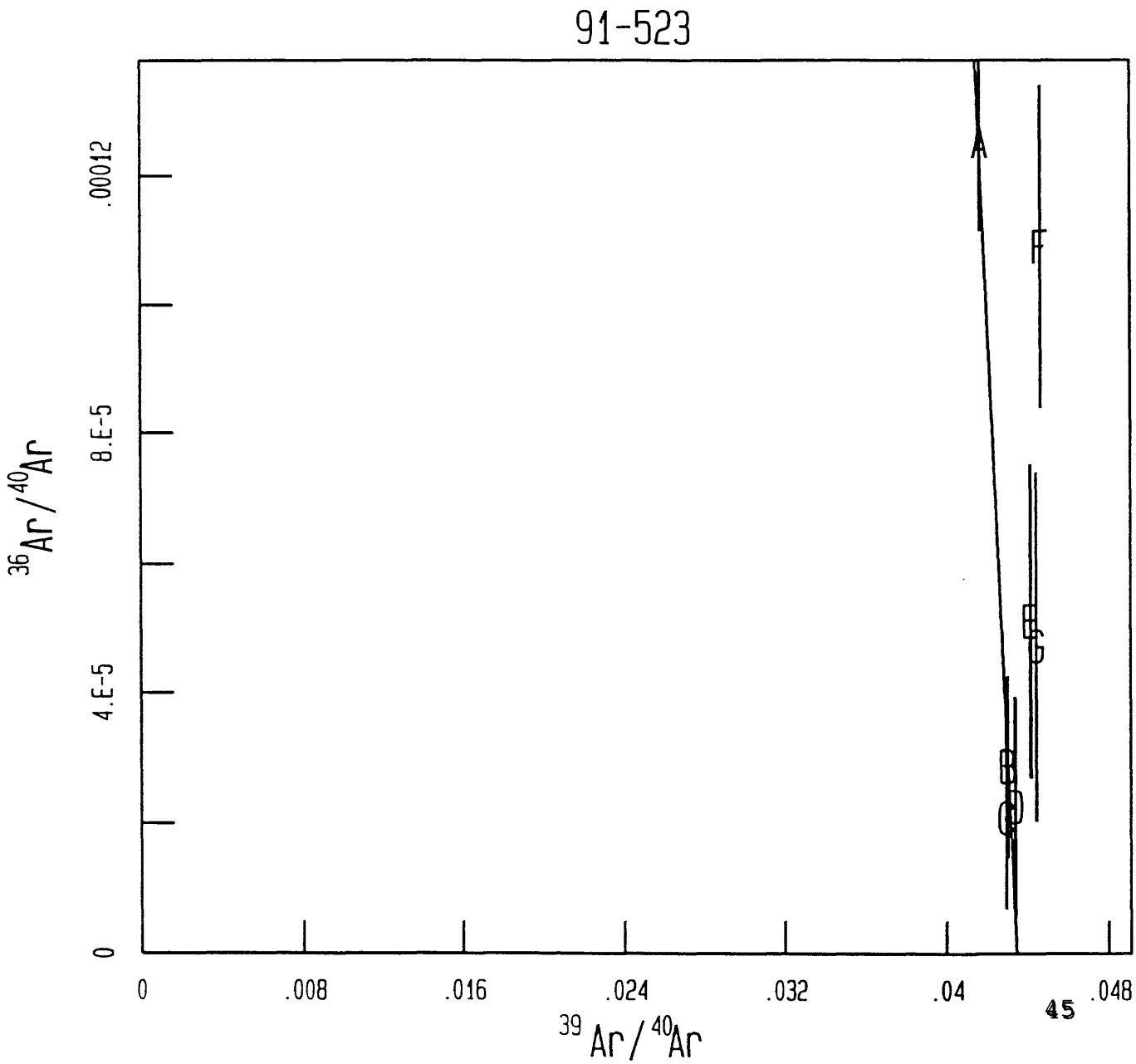
81.6% of gas on plateau, steps 1050 through 1125 PLATEAU AGE = 345.83 + 1.76

Note: all gas quantities are in moles. No blank correction.
* Ages calculated assuming initial 40Ar/36Ar = 295.5 ▪ 0
** 1-sigma precision estimates are for intra-sample reproducibility.
** 1-sigma precision estimates for plateaux are for intra-irradiation package reproducibility.
*** below detection limit


.1
K/Ca
.01
91-523
HORNBLENDE
Apparent Age (Ma)
350
300
0
39Ar K RELEASED (%)
100

v 06/13/92 00:32:17 23 Jan 1993 91-523 #120,121 RD85

Points EFG deleted;
 4 points regressed out of 7 includes 91.4 % of 39Ar
Mean X = .427E-01 Mean Y = .535E-04 Slope = -.705E-01 ä+Ç .119E-01
36/40 = .306E-02 ä+Ç .506E-03 39/40 = .434E-01 ä+Ç .168E-03
Fit parameters: SUMS = 2.117 MSWD = 1.058
40Ar/36Ar = 326.59 ä+Ç 53.93 F = 23.034 ä+Ç .089 AGE = 345.14 ä+Ç 1.99 Ma



W/O POINTS EFG

v 06/13/92 91-523 #18 RD87 06:39:20 23 Jan 1993

R A W D A T A

FILE	TEMP	40Ar	39Ar	38Ar	37Ar	36Ar ä regression	TRAP CURRENT	MANIFOLD OPTION
34853	450	3152946	161371	5509	12	110	40	EALL
	▪	567	78	9	8	6		

C O R R E C T I O N S

TEMP C	39Ar Decay	37Ar Decay	-----K-derived---- 40Ar	38Ar	37Ar	----Ca-derived---- 39Ar	38Ar	36Ar	Cl-der 36Ar	Initial 38Ar
450	216	445	919	2167	0	0	0	0	1	20

All values in counts, corrected for mass discrimination

	TEMP C	% TOT 39Ar	RAD YIELD	APP K/Ca	APP K/Cl	F	AGE (Ma)	precision intra-sample	precision intra-package	precision inter-package
A	450	100.0	99.0	183.73	116	19.291	290.43 ▪	.17	1.36	1.91

Total gas K/Ca = 183.7

Precisions are 1 sigma, measured in Ma. Measured 40/36 atm = 296.5 ▪.5
J = 0.009055 ▪ 0.50% (intra-package) ▪ 0.50% (inter-package)
Trap current factors- 40: 2.26 100: 2.26 200: 1
Manifold factors- ALL: 1 SPLIT 1: 3.3 SPLIT 2: 10.89 SPLIT 3: 35.937
EALL: 2.1167 ESPLIT 1: 7.77 ESPLIT 2: 21.78
Sensitivity = 1.475E-17 % Reproducibility = .25 Detection limit = 40 counts
Data reduced assuming initial 40/36 = 295.50 ▪ 0.00
Ca-factors: 3637=2.6E-04▪1.7E-06 3837=3.2E-05▪2.4E-07 3937=6.7E-04▪3.7E-06
K-factors: 3739=0.0E+00▪2.2E-03 3839=1.3E-02▪2.4E-04 4039=5.7E-03▪4.0E-03

J = 0.009055 ▪ 0.50% SAMPLE WT = 0.0520 g

TEMP C	Initial & radiogenic 40Ar	Potassium derived 39Ar	Chlorine derived 38Ar	Calcium derived 37Ar	Initial 36Ar	AGE* in Ma	**
450	2.224E-10	1.141E-11	2.379E-13	3.230E-14	7.712E-15	290.43 ▪	.17

Note: all gas quantities are in moles. No blank correction.
* Ages calculated assuming initial 40Ar/36Ar = 295.5 ▪ 0
** 1-sigma precision estimates are for intra-sample reproducibility.
** 1-sigma precision estimates for plateaux are for intra-irradiation package reproducibility.
*** below detection limit

R A W D A T A

FILE	TEMP	40Ar	39Ar	38Ar	37Ar	36Ar	TRAP	MANIFOLD
					ä regression		CURRENT	OPTION
32772	900	180332	10583	77	0	12	200	EALL
	▪	41	11	12	10	2		
32773	950	463481	27555	377	0	28	200	EALL
	▪	925	33	3	5	7		
32774	1000	1046930	61678	791	0	52	200	EALL
	▪	867	67	14	16	5		
32775	1050	2831884	167545	2121	0	50	200	EALL
	▪	1906	70	21	18	7		
32776	1100	1658661	99695	1263	0	25	200	EALL
	▪	2612	155	10	16	6		
32777	1150	641014	38414	492	0	31	200	EALL
	▪	227	20	12	19	2		
32778	1200	511962	30601	399	7	26	200	EALL
	▪	627	14	19	9	6		
32779	1250	529934	31652	402	0	10	200	EALL
	▪	355	12	12	12	3		
32780	1450	1666771	99135	1225	356	22	200	EALL
	▪	2650	148	11	8	4		

C O R R E C T I O N S

TEMP	39Ar	37Ar	-----K-derived----			----Ca-derived----			Cl-der	Initial
C	Decay	Decay	40Ar	38Ar	37Ar	39Ar	38Ar	36Ar	36Ar	38Ar
900	3	0	60	142	0	0	0	0	-0	2
950	7	0	157	370	0	0	0	0	0	5
1000	16	0	351	827	0	0	0	0	-0	10
1050	45	0	953	2248	0	0	0	0	-0	9
1100	27	0	567	1337	0	0	0	0	-0	5
1150	10	0	218	515	0	0	0	0	-0	6
1200	8	8	174	411	0	0	0	0	-0	5
1250	8	0	180	425	0	0	0	0	-0	2
1450	26	406	564	1330	0	1	0	0	-0	4

All values in counts, corrected for mass discrimination

v 06/13/92 91522 #22 RD87 02:33:47 23 Jan 1993

TEMP C	% TOT 39Ar	RAD YIELD	APP K/Ca	APP K/Cl	F	AGE (Ma)	precision intra-sample	precision intra-package	precision inter-package
A 900	1.9	98.1	0.00	0	16.685	253.82 ▪	.66	1.36	1.81
B 950	4.9	98.2	0.00	5188	16.500	251.20 ▪	1.19	1.67	2.04
C 1000	10.9	98.5	0.00	0	16.700	254.03 ▪	.39	1.25	1.72
D 1050	29.6	99.5	0.00	0	16.789	255.30 ▪	.24	1.22	1.70
E 1100	17.6	99.6	0.00	0	16.538	251.75 ▪	.45	1.26	1.72
F 1150	6.8	98.5	0.00	0	16.421	250.08 ▪	.22	1.19	1.67
G 1200	5.4	98.5	1096.83	0	16.451	250.51 ▪	.94	1.50	1.91
H 1250	5.6	99.4	0.00	0	16.624	252.97 ▪	.38	1.24	1.72
I 1450	17.5	99.6	67.56	0	16.724	254.38 ▪	.41	1.26	1.73
Total gas K/Ca =			71.0						

Precisions are 1 sigma, measured in Ma. Measured 40/36 atm = 296.5 ▪.5
J = 0.009055 ▪ 0.50% (intra-package) ▪ 0.50% (inter-package)
Trap current factors- 40: 5.66 100: 2.26 200: 1
Manifold factors- ALL: 1 SPLIT 1: 3.515 SPLIT 2: 10.89 SPLIT 3: 35.937
EALL: 2 ESPLIT 1: 6.6 ESPLIT 2: 21.78
Sensitivity = 1.344E-17 % Reproducibility = .25 Detection limit = 40 counts
Data reduced assuming initial 40/36 = 295.50 ▪ 0.00
Ca-factors: 3637=2.6E-04▪1.7E-06 3837=3.2E-05▪2.4E-07 3937=6.7E-04▪3.7E-06
K-factors: 3739=0.0E+00▪2.2E-03 3839=1.3E-02▪2.4E-04 4039=5.7E-03▪4.0E-03

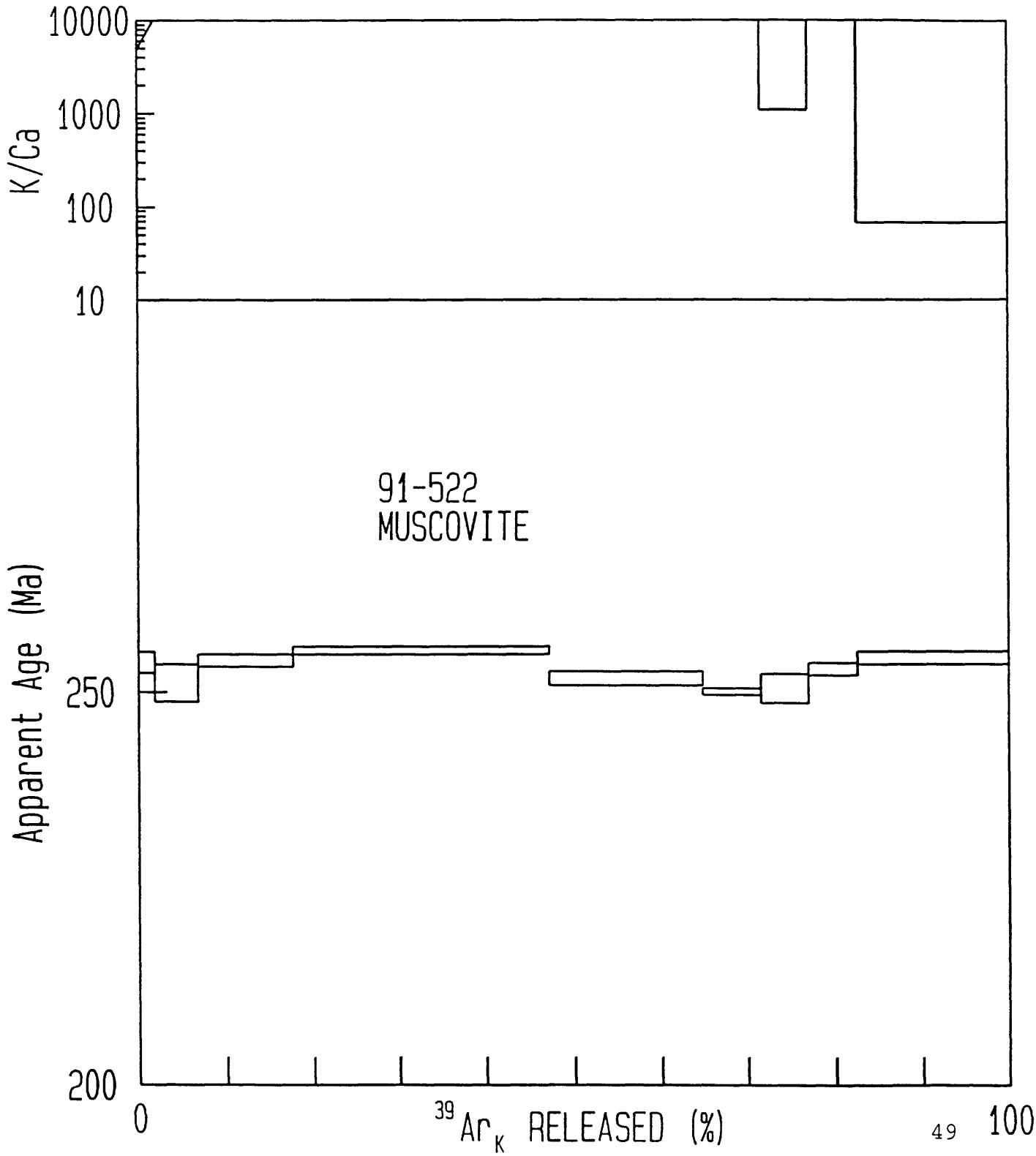
J = 0.009055 ▪ 0.50% SAMPLE WT = 0.1016 g

TEMP C	Initial & radiogenic 40Ar	Potassium derived 39Ar	Chlorine derived 38Ar	Calcium derived 37Ar	Initial 36Ar	AGE* in Ma	**
900	4.846E-12	2.848E-13	***	***	***	253.82 ▪	.66
950	1.245E-11	7.415E-13	***	***	***	251.20 ▪	1.19
1000	2.813E-11	1.660E-12	***	***	1.404E-15	254.03 ▪	.39
1050	7.610E-11	4.509E-12	***	***	1.360E-15	255.30 ▪	.24
1100	4.457E-11	2.683E-12	***	***	***	251.75 ▪	.45
1150	1.722E-11	1.034E-12	***	***	***	250.08 ▪	.22
1200	1.376E-11	8.235E-13	***	***	***	250.51 ▪	.94
1250	1.424E-11	8.518E-13	***	***	***	252.97 ▪	.38
1450	4.479E-11	2.668E-12	***	2.053E-14	***	254.38 ▪	.41
TOTAL GAS	2.561E-10	1.525E-11	***	2.092E-14	6.916E-15	253.41	

NO PLATEAU

Note: all gas quantities are in moles. No blank correction.
* Ages calculated assuming initial 40Ar/36Ar = 295.5 ▪ 0
** 1-sigma precision estimates are for intra-sample reproducibility.
** 1-sigma precision estimates for plateaux are for intra-irradiation package reproducibility.
*** below detection limit

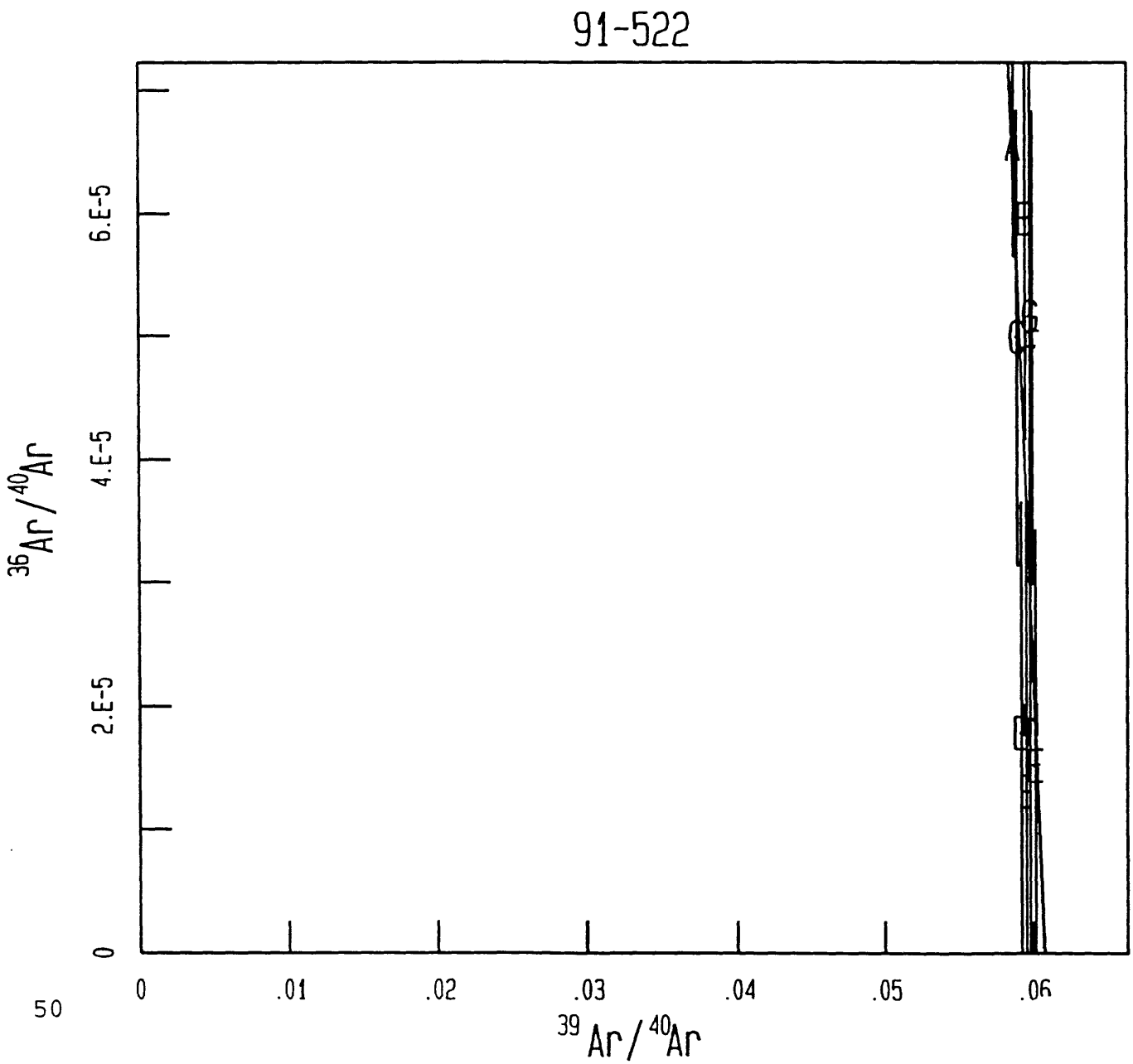
v 06/13/92 02:35:16 23 Jan 1993 91522 #22 RD87
v 06/13/92 02:42:15 23 Jan 1993 91-522 #22 RD87



v 06/13/92 (40/36in = 295.5)

v 06/13/92 02:56:32 23 Jan 1993 91-522 #22 RD87

Points EFGHI deleted;
4 points regressed out of 9 includes 47.2 % of 39Ar
Mean X = .590E-01 Mean Y = .562E-04 Slope = -.316E-01 ä+Ç .248E-01
36/40 = .192E-02 ä+Ç .147E-02 39/40 = .608E-01 ä+Ç .145E-02
Fit parameters: SUMS = 3.894 MSWD = 1.947
40Ar/36Ar = 520.87 ä+Ç 397.56 F = 16.459 ä+Ç .394 AGE = 250.62 ä+Ç 5.72 Ma



50

W/O POINTS EFGHI

v 06/13/92 03:41:53 23 Jan 1993
91-530 #26 RD87

J = 0.009055 ▪ 0.50% SAMPLE WT = 0.1008 g

TEMP C	Initial & radiogenic 40Ar	Potassium derived 39Ar	Chlorine derived 38Ar	Calcium derived 37Ar	Initial 36Ar	AGE* in Ma	**
1150	4.708E-12	2.816E-13	***	***	***	248.02 ▪	1.80
1200	6.507E-12	3.875E-13	***	***	***	251.98 ▪	3.08
1250	8.167E-12	4.883E-13	***	***	***	252.57 ▪	2.19
1450	2.802E-11	1.684E-12	***	3.765E-14	***	251.67 ▪	.36
TOTAL GAS	4.740E-11	2.842E-12	***	3.886E-14	1.514E-15	251.51	

90.1% of gas on plateau, steps 1200 through 1450 PLATEAU AGE = 251.70 + 1.31

Note: all gas quantities are in moles. No blank correction.
* Ages calculated assuming initial 40Ar/36Ar = 295.5 ▪ 0
** 1-sigma precision estimates are for intra-sample reproducibility.
** 1-sigma precision estimates for plateaux are for intra-irradiation package reproducibility.
*** below detection limit

v 06/13/92

R A W D A T A

FILE	TEMP	40Ar	39Ar	38Ar	37Ar	36Ar	TRAP CURRENT	MANIFOLD OPTION
		ä regression						
32757	1150	175190	10465	74	3	16	200	EALL
	▪	118	20	10	11	4		
32758	1200	242162	14399	83	17	12	200	EALL
	▪	144	7	12	2	11		
32759	1250	303927	18147	109	1	8	200	EALL
	▪	211	21	14	12	9		
32760	1450	1042624	62593	789	661	22	200	EALL
	▪	1176	81	2	16	4		

C O R R E C T I O N S

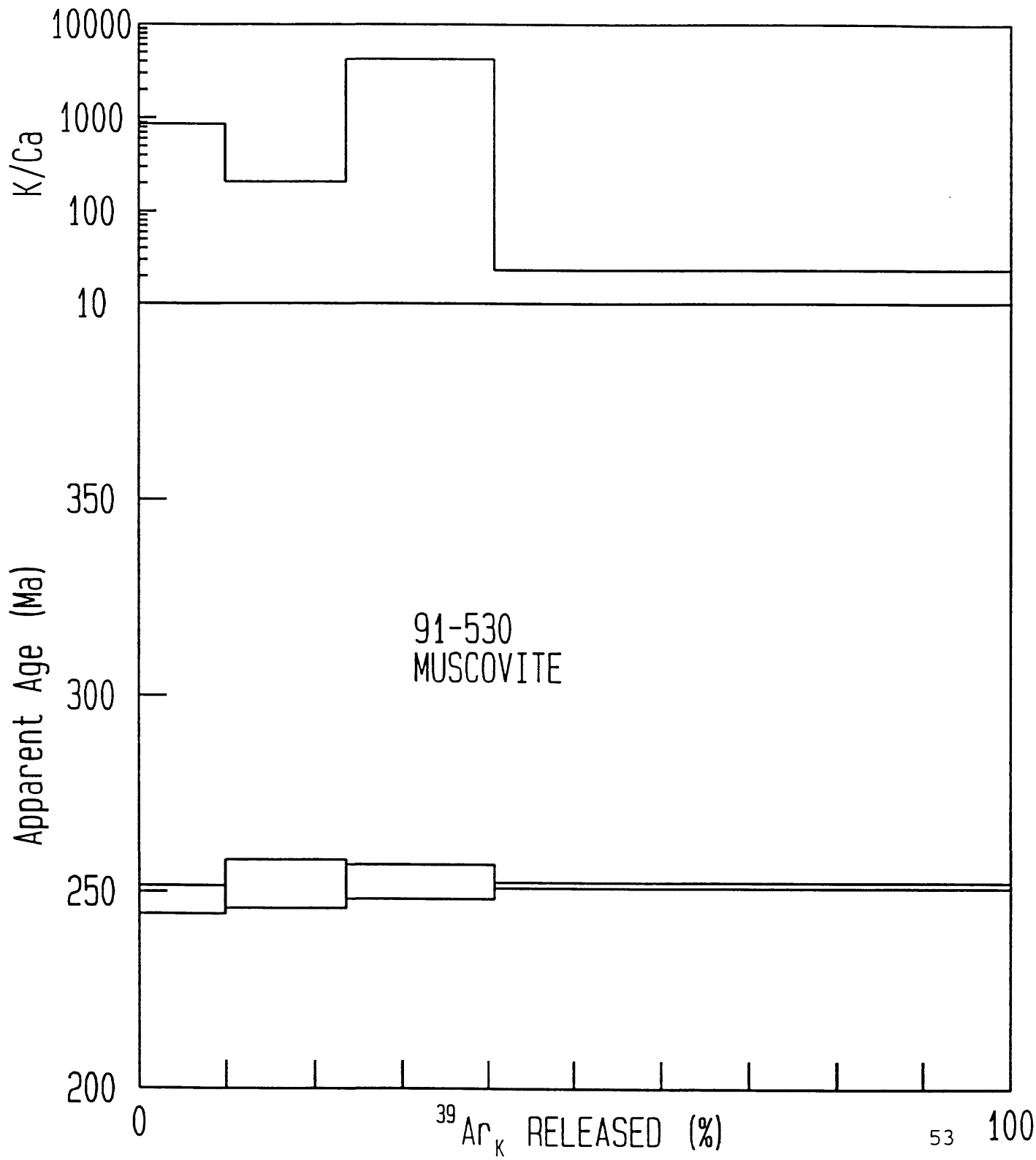
TEMP	39Ar	37Ar	-----K-derived----			----Ca-derived----			Cl-der	Initial
C	Decay	Decay	40Ar	38Ar	37Ar	39Ar	38Ar	36Ar	36Ar	38Ar
1150	3	3	60	140	0	0	0	0	-0	3
1200	4	19	82	193	0	0	0	0	-0	2
1250	5	1	103	243	0	0	0	0	-0	1
1450	16	737	356	840	0	1	0	0	-0	4

All values in counts, corrected for mass discrimination

	TEMP C	% TOT 39Ar	RAD YIELD	APP K/Ca	APP K/Cl	F	AGE (Ma)	precision intra-sample	precision intra-package	precision inter-package
A	1150	9.9	97.4	864.30	0	16.277	248.02 ▪	1.80	2.15	2.44
B	1200	13.6	98.6	207.21	0	16.555	251.98 ▪	3.08	3.30	3.50
C	1250	17.2	99.2	4256.60	0	16.596	252.57 ▪	2.19	2.49	2.76
D	1450	59.3	99.4	23.26	0	16.533	251.67 ▪	.36	1.23	1.70

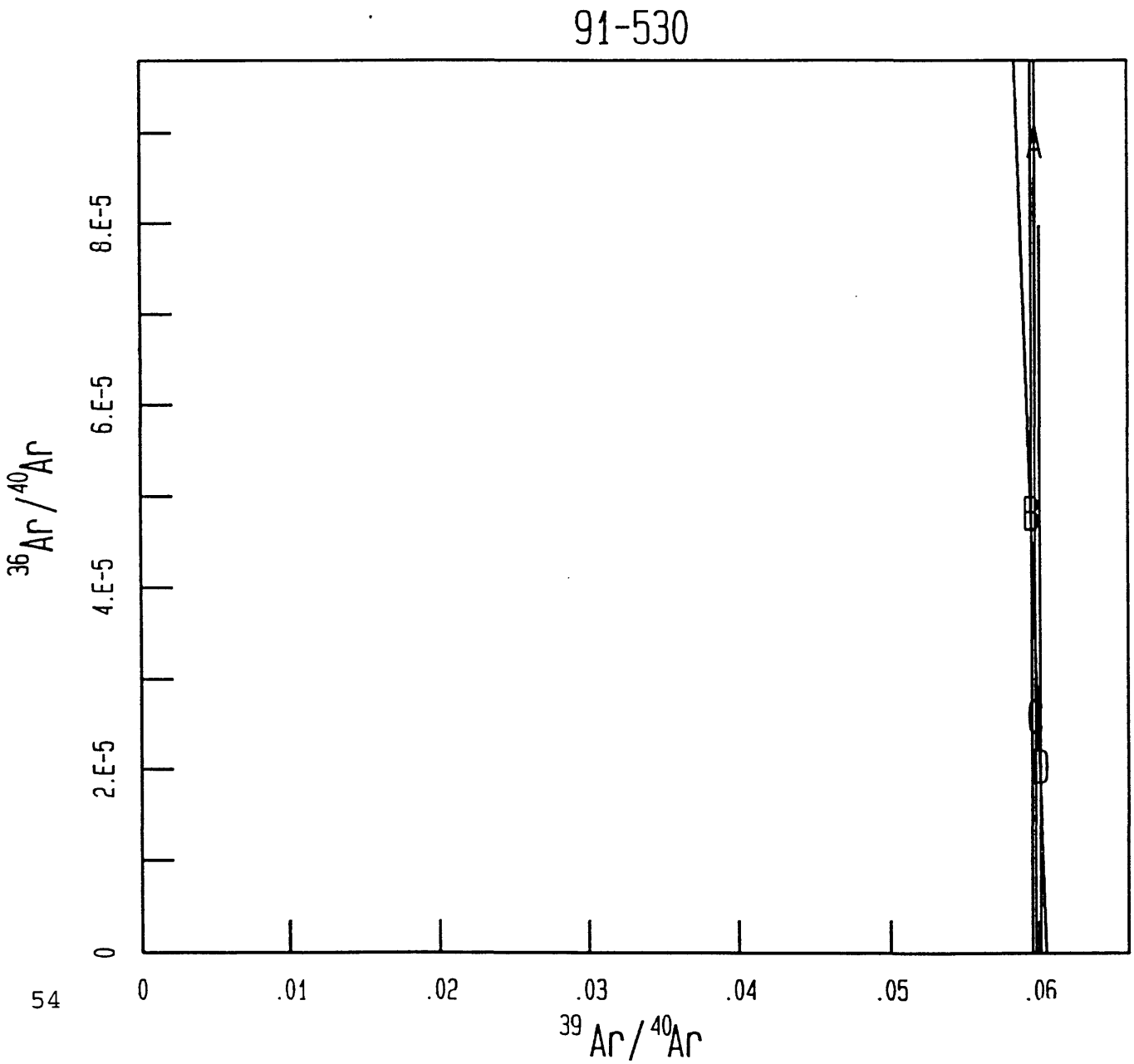
Total gas K/Ca = 859.1

Precisions are 1 sigma, measured in Ma. Measured 40/36 atm = 296.5 ▪.5
J = 0.009055 ▪ 0.50% (intra-package) ▪ 0.50% (inter-package)
Trap current factors- 40: 5.66 100: 2.26 200: 1
Manifold factors- ALL: 1 SPLIT 1: 3.51 SPLIT 2: 10.89 SPLIT 3: 35.937
EALL: 2 ESPLIT 1: 6.6 ESPLIT 2: 21.78
Sensitivity = 1.344E-17 % Reproducibility = .25 Detection limit = 40 counts
Data reduced assuming initial 40/36 = 295.50 ▪ 0.00
Ca-factors: 3637=2.6E-04▪1.7E-06 3837=3.2E-05▪2.4E-07 3937=6.7E-04▪3.7E-06
K-factors: 3739=0.0E+00▪2.2E-03 3839=1.3E-02▪2.4E-04 4039=5.7E-03▪4.0E-03


10000
1000
100
10
K/Ca
350
300
250
200
Apparent Age (Ma)
91-530
MUSCOVITE
0
39Ar K RELEASED (%)
53
100

v 06/13/92 03:46:08 23 Jan 1993 91-530 #26 RD87

Point A deleted;
 3 points regressed out of 4 includes 90.1 % of 39Ar
Mean X = .598E-01 Mean Y = .334E-04 Slope = -.487E-01 ä+Ç .136E+00
36/40 = .294E-02 ä+Ç .813E-02 39/40 = .605E-01 ä+Ç .205E-02
Fit parameters: SUMS = .021 MSWD = .021
40Ar/36Ar = 339.82 ä+Ç 938.94 F = 16.536 ä+Ç .559 AGE = 251.71 ä+Ç 8.04 Ma



W/O POINTS A

R A W D A T A

FILE	TEMP	40Ar	39Ar	38Ar	37Ar	36Ar regression	TRAP CURRENT	MANIFOLD OPTION
32692	1200	390873	19317	632	105482	93	200	EALL
	±	292	35	13	94	7		
32693	1225	489937	24420	963	131906	109	200	EALL
	±	338	11	10	84	6		
32694	1250	306726	15422	503	81556	76	200	EALL
	±	264	13	10	26	5		
32695	1350	728835	37168	1467	194810	146	200	EALL
	±	839	17	7	261	6		
32696	1450	686929	34701	1362	178182	137	200	EALL
	±	1136	55	14	247	7		

C O R R E C T I O N S

TEMP °C	39Ar Decay	37Ar Decay	-----K-derived---- 40Ar	38Ar	37Ar	----Ca-derived---- 39Ar	38Ar	36Ar	Cl-der 36Ar	Initial 38Ar
1200	5	110280	109	257	0	146	7	57	0	7
1225	6	138031	138	325	0	182	9	72	0	7
1250	4	85421	87	205	0	113	5	44	0	6
1350	9	204233	210	495	0	270	13	106	0	8
1450	9	186971	196	462	0	247	12	97	0	8

All values in counts, corrected for mass discrimination

	TEMP C	% TOT 39Ar	RAD YIELD	APP K/Ca	APP K/Cl	F	AGE (Ma)	precision intra-sample	precision intra-package	precision inter-package
A	1200	14.7	97.2	.05	123	19.784	298.44 ±	1.59	2.11	2.52
B	1225	18.6	97.7	.05	92	19.711	297.41 ±	1.01	1.71	2.19
C	1250	11.8	96.9	.05	124	19.378	292.77 ±	1.27	1.86	2.30
D	1350	28.4	98.3	.05	92	19.386	292.89 ±	.76	1.55	2.06
E	1450	26.5	98.2	.05	93	19.546	295.12 ±	.96	1.67	2.16

Total gas K/Ca = 0.0

Precisions are 1 sigma, measured in Ma. Measured 40/36 atm = 297.2 ±.5
J = 0.009093 ± 0.50% (intra-package) ± 0.50% (inter-package)
Trap current factors- 40: 5.66 100: 2.62 200: 1
Manifold factors- ALL: 1 SPLIT 1: 3.3 SPLIT 2: 10.89 SPLIT 3: 35.937
EALL: 2 ESPLIT 1: 6.6 ESPLIT 2: 21.78
Sensitivity = 1.000E-17 % Reproducibility = .25 Detection limit = 40 counts
Data reduced assuming initial 40/36 = 295.50 ± 0.00
Ca-factors: 3637=2.6E-04±1.7E-06 3837=3.2E-05±2.4E-07 3937=6.7E-04±3.7E-06
K-factors: 3739=0.0E+00±2.2E-03 3839=1.3E-02±2.4E-04 4039=5.7E-03±4.0E-03

v 06/13/92 08:48:38 28 Aug 1992

91-531 #34,35 HBL CONC RD87

J = 0.009093 ± 0.50% SAMPLE WT = 0.4553 g

TEMP C	Initial & radiogenic 40Ar	Potassium derived 39Ar	Chlorine derived 38Ar	Calcium derived 37Ar	Initial 36Ar	AGE* in Ma	**
1200	7.815E-12	3.841E-13	7.529E-15	4.334E-12	***	298.44 ±	1.59
1225	9.796E-12	4.856E-13	1.279E-14	5.422E-12	***	297.41 ±	1.01
1250	6.133E-12	3.067E-13	5.993E-15	3.354E-12	***	292.77 ±	1.27
1350	1.457E-11	7.392E-13	1.942E-14	8.015E-12	8.189E-16	292.89 ±	.76
1450	1.373E-11	6.903E-13	1.799E-14	7.335E-12	8.225E-16	295.12 ±	.96
TOTAL GAS	5.205E-11	2.606E-12	6.372E-14	2.846E-11	3.776E-15	295.13	

66.6% of gas on plateau, steps 1250 through 1450 PLATEAU AGE = 293.57 + 1.38

Note: all gas quantities are in moles. No blank correction.

* Ages calculated assuming initial 40Ar/36Ar = 295.5 ± 0

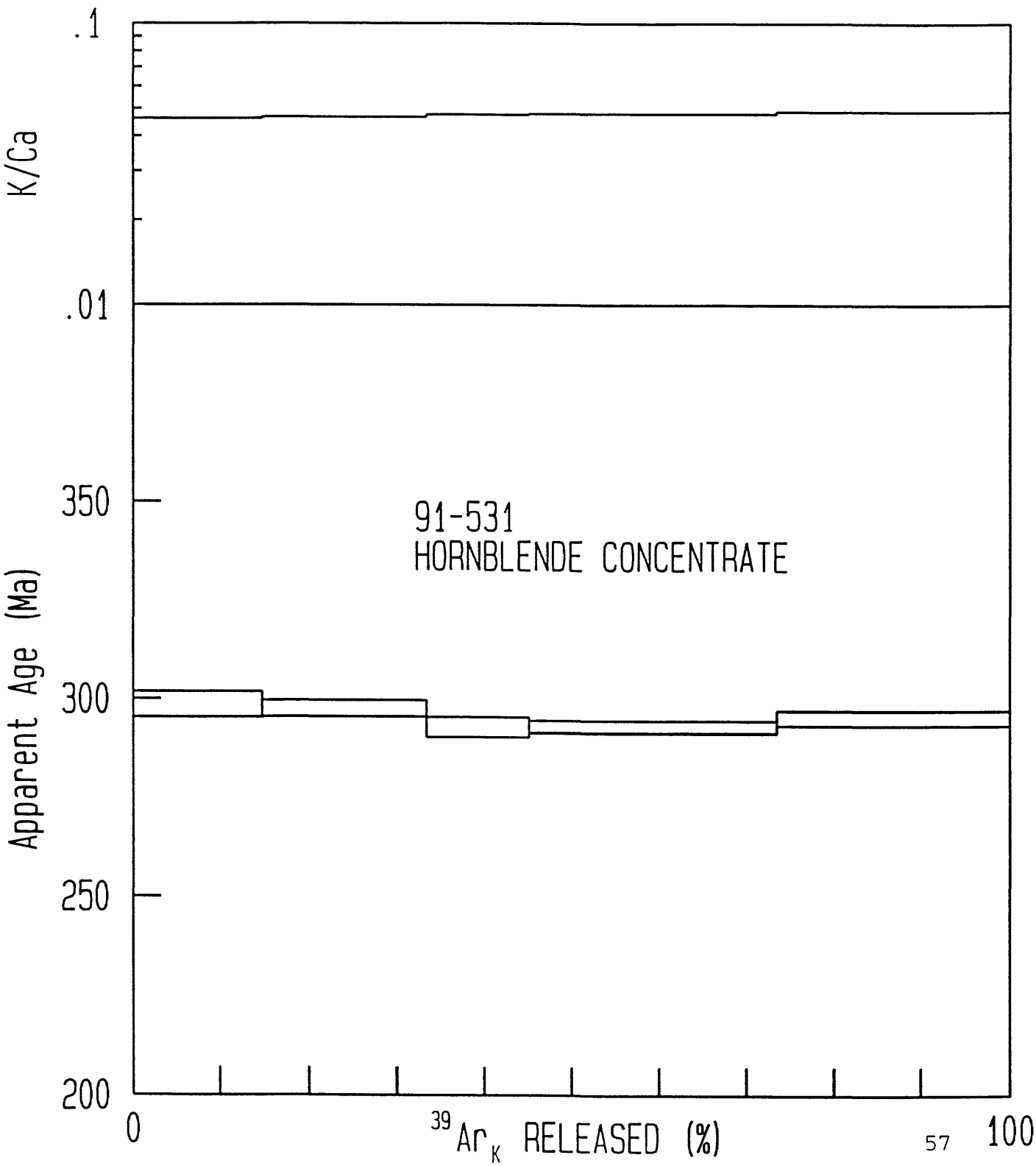
** 1-sigma precision estimates are for intra-sample reproducibility.

** 1-sigma precision estimates for plateaux are for intra-irradiation package reproducibility.

*** below detection limit

v 06/13/92

v 06/13/92 04:00:19 23 Jan 1993 91-531 #34,35 RD87

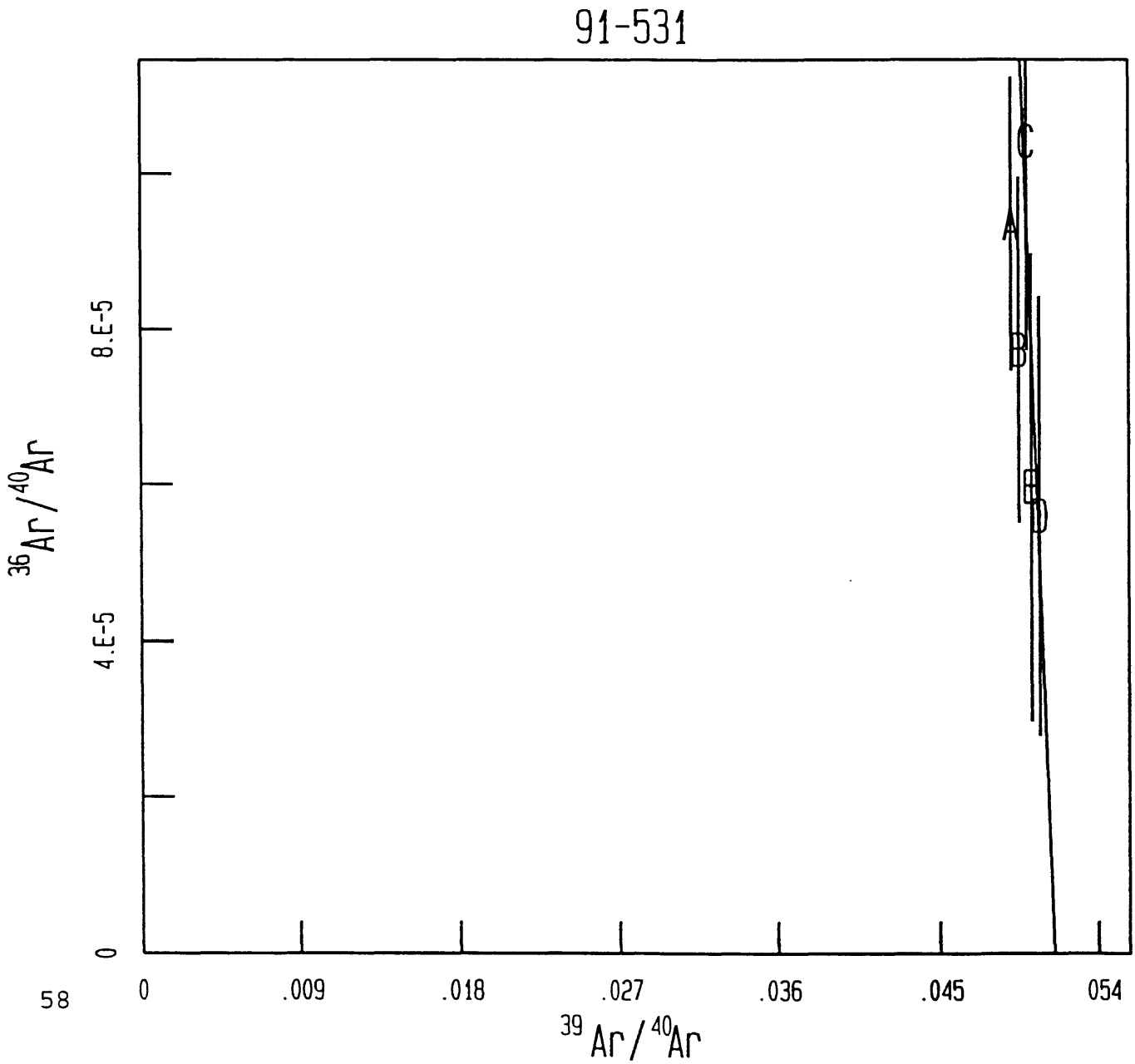


v 06/13/92

(40/36in = 295.5)

v 06/13/92 04:04:58 23 Jan 1993 91-531 #34,35 RD87

Points AB deleted;
3 points regressed out of 5 includes 66.6 % of 39Ar
Mean X = .503E-01 Mean Y = .751E-04 Slope = -.630E-01 ä+Ç .548E-01
36/40 = .324E-02 ä+Ç .276E-02 39/40 = .515E-01 ä+Ç .108E-02
Fit parameters: SUMS = .571 MSWD = .571
40Ar/36Ar = 308.33 ä+Ç 262.15 F = 19.423 ä+Ç .409 AGE = 293.4 ä+Ç 5.86 Ma



W/O POINTS AB

	TEMP C	% TOT 39Ar	RAD YIELD	APP K/Ca	APP K/Cl	F	AGE (Ma)	precision intra-sample	precision intra-package	precision inter-package
A	750	2.3	93.6	2367.85	0	16.861	256.32 ▪	1.11	1.63	2.03
B	900	49.1	98.7	195.46	0	16.642	253.22 ▪	.19	1.20	1.69
C	950	15.1	99.7	0.00	0	16.492	251.09 ▪	.13	1.18	1.67
D	1000	5.7	98.6	0.00	0	16.407	249.89 ▪	.47	1.26	1.72
E	1050	5.0	98.9	0.00	0	16.467	250.73 ▪	.80	1.42	1.84
F	1100	6.4	98.8	0.00	0	16.395	249.70 ▪	.36	1.22	1.69
G	1150	11.9	99.4	0.00	0	16.452	250.52 ▪	.33	1.22	1.69
H	1200	4.4	99.2	0.00	8337	16.486	251.01 ▪	.77	1.41	1.83

Total gas K/Ca = 150.9

Precisions are 1 sigma, measured in Ma. Measured 40/36 atm = 296.5 ▪.5
J = 0.009055 ▪ 0.50% (intra-package) ▪ 0.50% (inter-package)
Trap current factors- 40: 2.26 100: 2.26 200: 1
Manifold factors- ALL: 1 SPLIT 1: 3.3 SPLIT 2: 10.89 SPLIT 3: 35.937
EALL: 2.1167 ESPLIT 1: 7.77 ESPLIT 2: 21.78
Sensitivity = 1.475E-17 % Reproducibility = .25 Detection limit = 40 counts
Data reduced assuming initial 40/36 = 295.50 ▪ 0.00
Ca-factors: 3637=2.6E-04▪1.7E-06 3837=3.2E-05▪2.4E-07 3937=6.7E-04▪3.7E-06
K-factors: 3739=0.0E+00▪2.2E-03 3839=1.3E-02▪2.4E-04 4039=5.7E-03▪4.0E-03

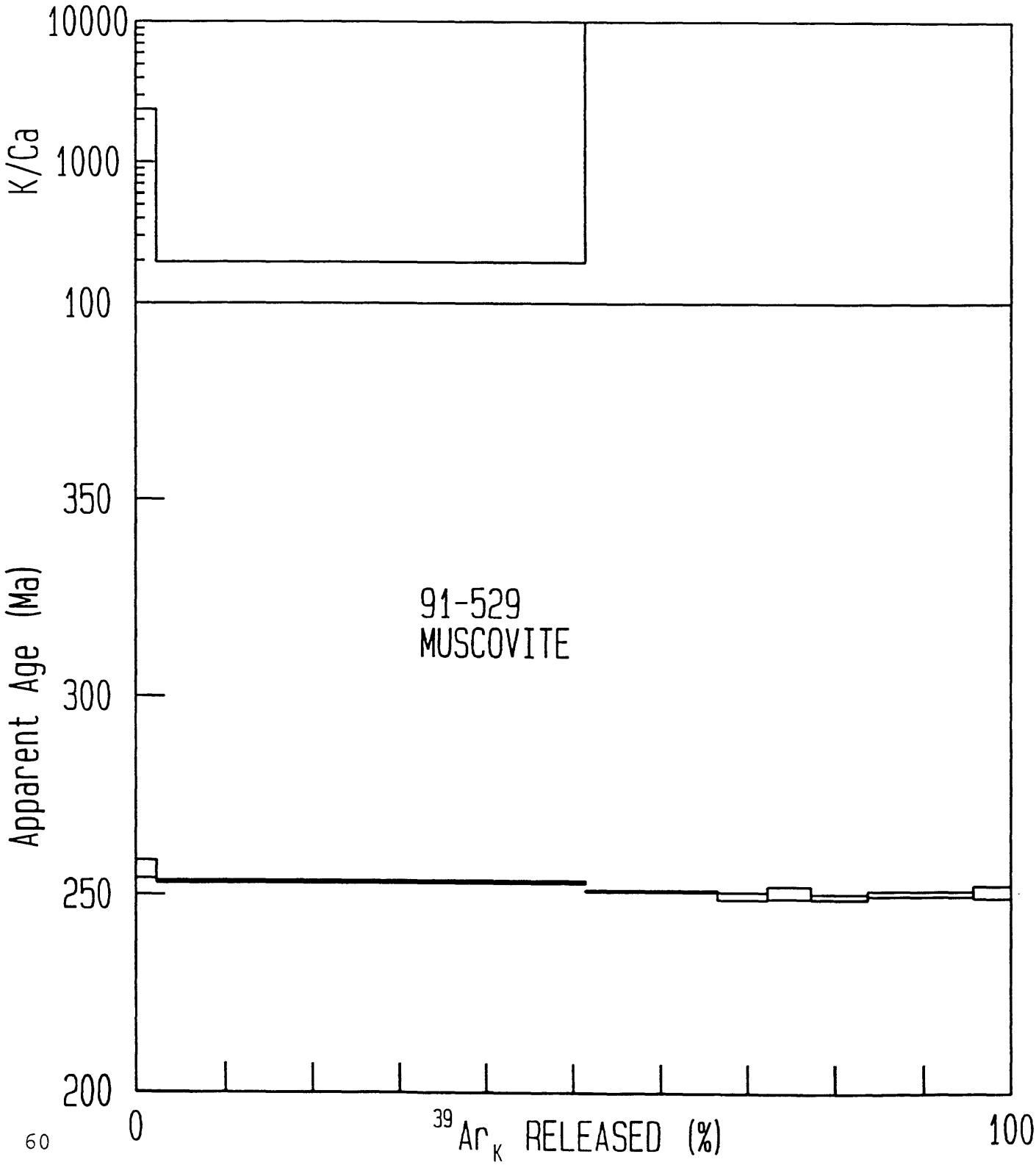
J = 0.009055 ▪ 0.50% SAMPLE WT = 0.1011 g

TEMP C	Initial & radiogenic 40Ar	Potassium derived 39Ar	Chlorine derived 38Ar	Calcium derived 37Ar	Initial 36Ar	AGE* in Ma	**
750	1.115E-11	6.189E-13	***	***	2.404E-15	256.32 ▪	1.11
900	2.207E-10	1.309E-11	***	3.483E-14	9.616E-15	253.22 ▪	.19
950	6.648E-11	4.020E-12	***	***	***	251.09 ▪	.13
1000	2.544E-11	1.529E-12	***	***	***	249.89 ▪	.47
1050	2.233E-11	1.341E-12	***	***	***	250.73 ▪	.80
1100	2.838E-11	1.710E-12	***	***	***	249.70 ▪	.36
1150	5.265E-11	3.180E-12	***	***	***	250.52 ▪	.33
1200	1.947E-11	1.171E-12	***	***	***	251.01 ▪	.77
TOTAL GAS	4.466E-10	2.666E-11	***	3.497E-14	1.748E-14	252.01	

NO PLATEAU

Note: all gas quantities are in moles. No blank correction.
* Ages calculated assuming initial 40Ar/36Ar = 295.5 ▪ 0
** 1-sigma precision estimates are for intra-sample reproducibility.
** 1-sigma precision estimates for plateaux are for intra-irradiation package reproducibility.
*** below detection limit

v 06/13/92 06:28:22 23 Jan 1993 91-529 #20 RD87

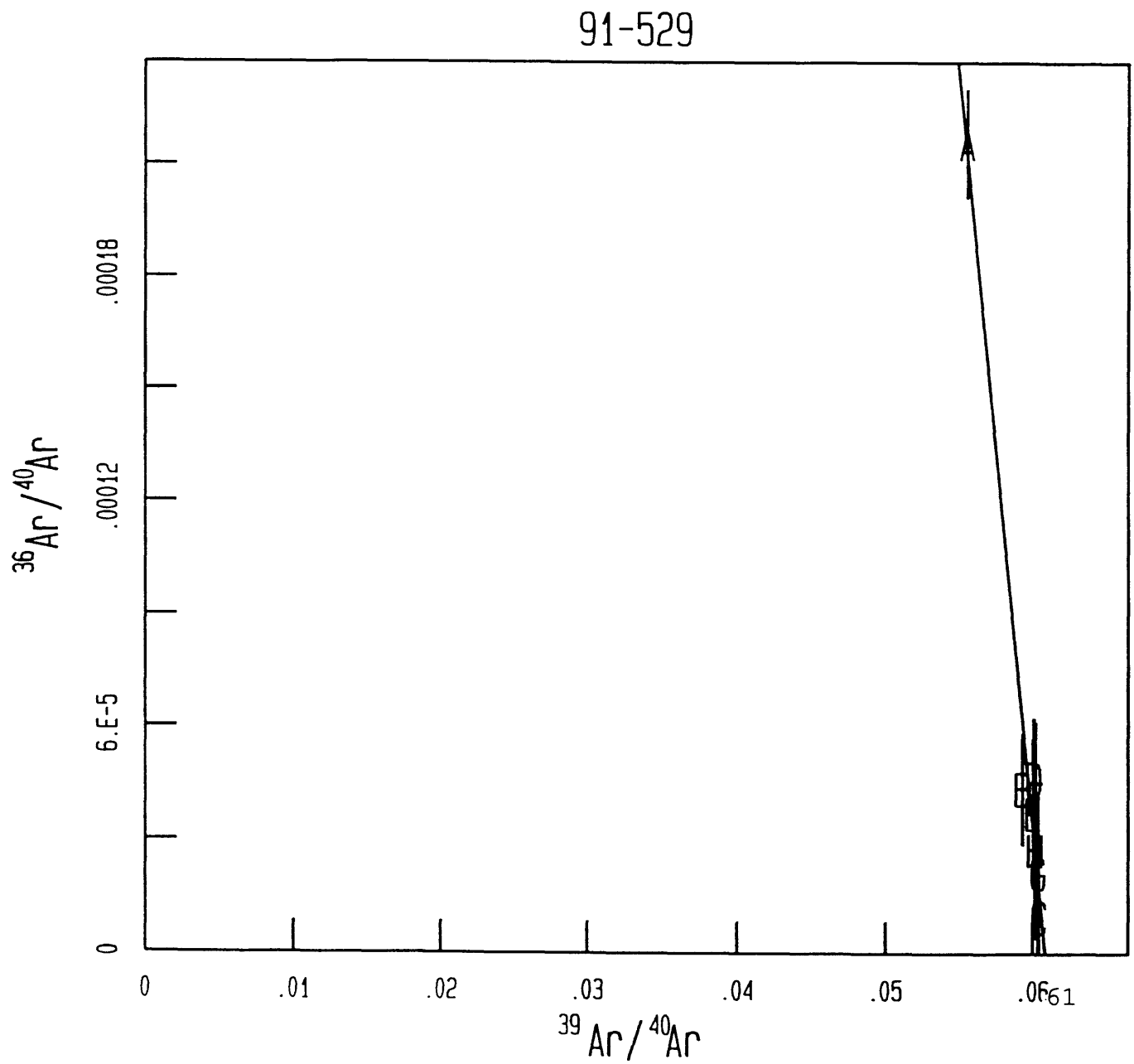


v 06/13/92

(40/36in = 295.5)

v 06/13/92 06:32:19 23 Jan 1993 91-529 #20 RD87

Point deleted;
8 points regressed out of 8
Mean X = .593E-01 Mean Y = .647E-04 Slope = -.397E-01 ä+Ç .347E-02
36/40 = .242E-02 ä+Ç .206E-03 39/40 = .609E-01 ä+Ç .212E-03
Fit parameters: SUMS = 3.476 MSWD = .579
40Ar/36Ar = 413.97 ä+Ç 35.3 F = 16.422 ä+Ç .057 AGE = 250.09 ä+Ç 1.42 Ma



v 06/13/92 91-529 #10 RD87 06:33:39 23 Jan 1993

R A W D A T A

FILE	TEMP	40Ar	39Ar	38Ar	37Ar	36Ar	TRAP CURRENT	MANIFOLD OPTION
						ä regression		
34849	450	1794937	95139	1688	0	41	40	EALL
	▪	728	37	7	8	4		

C O R R E C T I O N S

TEMP C	39Ar Decay	37Ar Decay	-----K-derived---- 40Ar	38Ar	37Ar	----Ca-derived---- 39Ar	38Ar	36Ar	Cl-der 36Ar	Initial 38Ar
450	127	0	542	1278	0	0	0	0	0	8

All values in counts, corrected for mass discrimination

	TEMP C	% TOT 39Ar	RAD YIELD	APP K/Ca	APP K/Cl	F	AGE (Ma)	precision intra-sample	precision intra-package	precision inter-package
A	450	100.0	99.3	0.00	548	18.692	280.43 ▪	.20	1.32	1.85

Total gas K/Ca = 0.0

Precisions are 1 sigma, measured in Ma. Measured 40/36 atm = 296.5 ▪.5
J = 0.008998 ▪ 0.50% (intra-package) ▪ 0.50% (inter-package)
Trap current factors- 40: 2.26 100: 2.26 200: 1
Manifold factors- ALL: 1 SPLIT 1: 3.3 SPLIT 2: 10.89 SPLIT 3: 35.937
EALL: 2.1167 ESPLIT 1: 7.77 ESPLIT 2: 21.78
Sensitivity = 1.475E-17 % Reproducibility = .25 Detection limit = 40 counts
Data reduced assuming initial 40/36 = 295.50 ▪ 0.00
Ca-factors: 3637=2.6E-04▪1.7E-06 3837=3.2E-05▪2.4E-07 3937=6.7E-04▪3.7E-06
K-factors: 3739=0.0E+00▪2.2E-03 3839=1.3E-02▪2.4E-04 4039=5.7E-03▪4.0E-03

J = 0.008998 ▪ 0.50% SAMPLE WT = 0.0508 g

TEMP C	Initial & radiogenic 40Ar	Potassium derived 39Ar	Chlorine derived 38Ar	Calcium derived 37Ar	Initial 36Ar	AGE* in Ma	**
450	1.266E-10	6.728E-12	2.972E-14	***	2.899E-15	280.43 ▪	.20

Note: all gas quantities are in moles. No blank correction.
* Ages calculated assuming initial 40Ar/36Ar = 295.5 ▪ 0
** 1-sigma precision estimates are for intra-sample reproducibility.
** 1-sigma precision estimates for plateaux are for intra-irradiation package reproducibility.
*** below detection limit

R A W D A T A

FILE	TEMP	40Ar	39Ar	38Ar	37Ar	36Ar	TRAP CURRENT	MANIFOLD OPTION
						ä regression		
34852	550	2677857	157414	4461	10	126	40	EALL
	▪	2962	96	11	11	6		

C O R R E C T I O N S

TEMP C	39Ar Decay	37Ar Decay	-----K-derived---- 40Ar	38Ar	37Ar	----Ca-derived---- 39Ar	38Ar	36Ar	Cl-der 36Ar	Initial 38Ar
550	211	374	896	2114	0	0	0	0	1	24

All values in counts, corrected for mass discrimination

	TEMP C	% TOT 39Ar	RAD YIELD	APP K/Ca	APP K/Cl	F	AGE (Ma)	precision intra-sample	precision intra-package	precision inter-package
A	550	100.0	98.6	212.86	161	16.733	254.51 ▪	.32	1.23	1.71

Total gas K/Ca = 212.9

Precisions are 1 sigma, measured in Ma. Measured 40/36 atm = 296.5 ▪.5
J = 0.009055 ▪ 0.50% (intra-package) ▪ 0.50% (inter-package)
Trap current factors- 40: 2.26 100: 2.26 200: 1
Manifold factors- ALL: 1 SPLIT 1: 3.3 SPLIT 2: 10.89 SPLIT 3: 35.937
EALL: 2.1167 ESPLIT 1: 7.77 ESPLIT 2: 21.78
Sensitivity = 1.475E-17 % Reproducibility = .25 Detection limit = 40 counts
Data reduced assuming initial 40/36 = 295.50 ▪ 0.00
Ca-factors: 3637=2.6E-04▪1.7E-06 3837=3.2E-05▪2.4E-07 3937=6.7E-04▪3.7E-06
K-factors: 3739=0.0E+00▪2.2E-03 3839=1.3E-02▪2.4E-04 4039=5.7E-03▪4.0E-03

J = 0.009055 ▪ 0.50% SAMPLE WT = 0.0526 g

TEMP C	Initial & radiogenic 40Ar	Potassium derived 39Ar	Chlorine derived 38Ar	Calcium derived 37Ar	Initial 36Ar	AGE* in Ma	**
550	1.889E-10	1.113E-11	1.678E-13	2.719E-14	8.885E-15	254.51 ▪	.32

Note: all gas quantities are in moles. No blank correction.
* Ages calculated assuming initial 40Ar/36Ar = 295.5 ▪ 0
** 1-sigma precision estimates are for intra-sample reproducibility.
** 1-sigma precision estimates for plateaux are for intra-irradiation package reproducibility.
*** below detection limit

R A W D A T A

FILE	TEMP	40Ar	39Ar	38Ar	37Ar	36Ar ä regression	TRAP CURRENT	MANIFOLD OPTION
32710	1225	240511	12697	682	116478	87	200	EALL
	▪	282	26	10	44	5		
32711	1250	215446	11696	662	108246	79	200	EALL
	▪	179	14	8	47	7		
32712	1350	530469	29519	1957	274638	194	200	EALL
	▪	304	20	8	360	6		
32713	1450	80224	4334	254	40147	42	200	EALL
	▪	122	7	11	80	6		

C O R R E C T I O N S

TEMP C	39Ar Decay	37Ar Decay	-----K-derived---- 40Ar	38Ar	37Ar	----Ca-derived---- 39Ar	38Ar	36Ar	Cl-der 36Ar	Initial 38Ar
1225	3	123998	71	168	0	162	8	64	0	4
1250	3	115339	66	155	0	151	7	59	0	4
1350	7	292899	166	391	0	383	18	150	0	8
1450	1	42855	24	57	0	56	3	22	0	4

All values in counts, corrected for mass discrimination

	TEMP C	% TOT 39Ar	RAD YIELD	APP K/Ca	APP K/Cl	F	AGE (Ma)	precision intra-sample	precision intra-package	precision inter-package
A	1225	21.8	97.1	.03	59	18.608	280.19 ▪	1.60	2.06	2.44
B	1250	20.1	97.2	.03	55	18.117	273.34 ▪	2.48	2.79	3.06
C	1350	50.7	97.5	.03	45	17.727	267.86 ▪	.83	1.50	1.95
D	1450	7.4	92.7	.03	52	17.362	262.73 ▪	5.76	5.89	6.02

Total gas K/Ca = 0.0

Precisions are 1 sigma, measured in Ma. Measured 40/36 atm = 296.5 ▪.5
J = 0.009030 ▪ 0.50% (intra-package) ▪ 0.50% (inter-package)
Trap current factors- 40: 5.66 100: 2.26 200: 1
Manifold factors- ALL: 1 SPLIT 1: 3.51 SPLIT 2: 10.89 SPLIT 3: 35.937
EALL: 2 ESPLIT 1: 6.6 ESPLIT 2: 21.78
Sensitivity = 1.344E-17 % Reproducibility = .25 Detection limit = 40 counts
Data reduced assuming initial 40/36 = 295.50 ▪ 0.00
Ca-factors: 3637=2.6E-04▪1.7E-06 3837=3.2E-05▪2.4E-07 3937=6.7E-04▪3.7E-06
K-factors: 3739=0.0E+00▪2.2E-03 3839=1.3E-02▪2.4E-04 4039=5.7E-03▪4.0E-03

v 06/13/92 04:09:11 23 Jan 1993

91-533 #41,42 RD87

J = 0.009030 ▪ 0.50% SAMPLE WT = 0.6030 g

TEMP C	Initial & radiogenic 40Ar	Potassium derived 39Ar	Chlorine derived 38Ar	Calcium derived 37Ar	Initial 36Ar	AGE* in Ma	**
1225	6.463E-12	3.373E-13	1.374E-14	6.480E-12	***	280.19 ▪	1.60
1250	5.789E-12	3.107E-13	1.357E-14	6.025E-12	***	273.34 ▪	2.48
1350	1.425E-11	7.841E-13	4.193E-14	1.529E-11	1.204E-15	267.86 ▪	.83
1450	2.156E-12	1.151E-13	5.317E-15	2.237E-12	***	262.73 ▪	5.76
TOTAL GAS	2.866E-11	1.547E-12	7.456E-14	3.004E-11	2.910E-15	271.28	

58.1% of gas on plateau, steps 1350 through 1450 PLATEAU AGE = 267.76 + 1.39

Note: all gas quantities are in moles. No blank correction.

* Ages calculated assuming initial 40Ar/36Ar = 295.5 ▪ 0

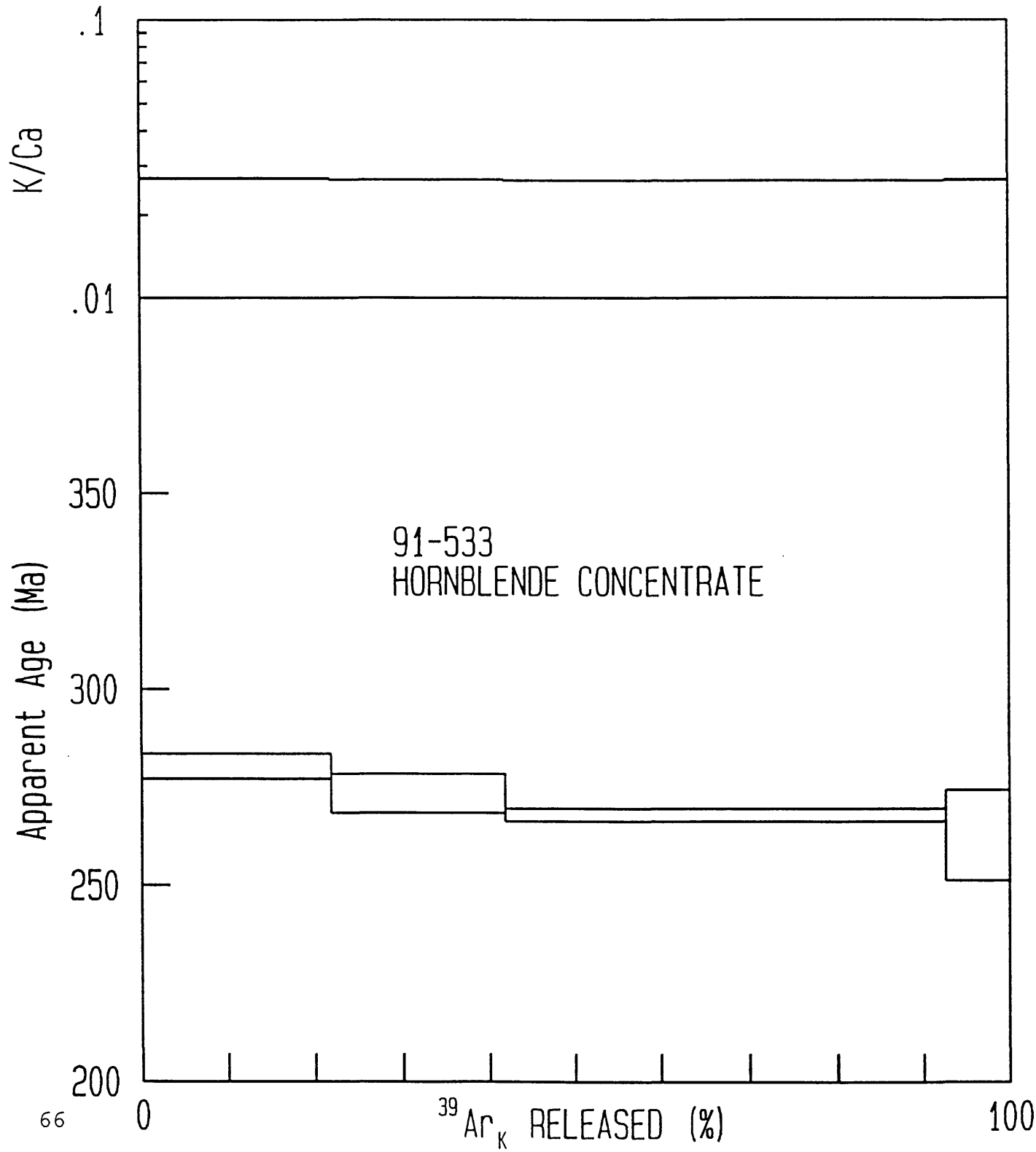
** 1-sigma precision estimates are for intra-sample reproducibility.

** 1-sigma precision estimates for plateaux are for intra-irradiation package reproducibility.

*** below detection limit

v 06/13/92

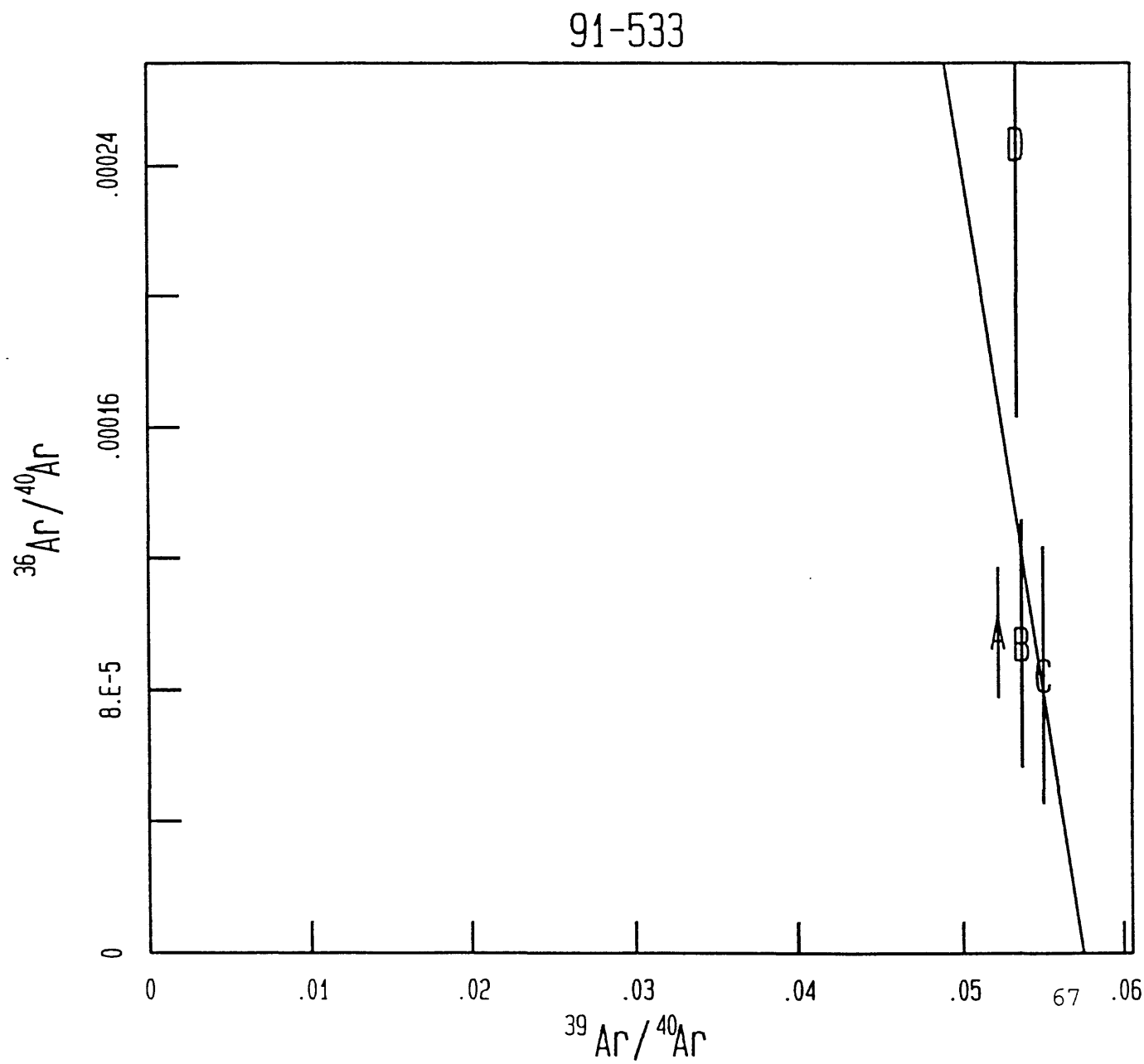
v 06/13/92 04:09:52 23 Jan 1993 91-533 #41,42 RD87



v 06/13/92 (40/36in = 295.5)

v 06/13/92 04:15:55 23 Jan 1993 91-533 #41,42 RD87

Point A deleted;
 3 points regressed out of 4 includes 78.2 % of 39Ar
Mean X = .542E-01 Mean Y = .105E-03 Slope = -.322E-01 ä+Ç .374E-01
36/40 = .185E-02 ä+Ç .203E-02 39/40 = .575E-01 ä+Ç .411E-02
Fit parameters: SUMS = 2.502 MSWD = 2.502
40Ar/36Ar = 539.74 ä+Ç 590.75 F = 17.403 ä+Ç 1.246 AGE = 263.31 ä+Ç 17.59 M
a



W/O POINTS A

R A W D A T A

FILE	TEMP	40Ar	39Ar	38Ar	37Ar	36Ar	TRAP	MANIFOLD
						ä regression	CURRENT	OPTION
19933:	850	295265	12194	211	1384	132	200	ALL
	▪	232	33	14	30	3		
19934:	950	301334	14673	268	3782	128	200	ALL
	▪	358	30	15	10	13		
19935:	1000	460394	22437	456	14395	184	200	ALL
	▪	257	32	23	21	17		
19936:	1050	1920587	100077	2215	71153	339	200	ALL
	▪	912	50	17	36	12		
19937:	1100	1691046	91817	1999	42627	169	100	ALL
	▪	679	30	8	27	12		
19938:	1125	3015702	168809	3706	74785	244	100	ALL
	▪	1641	38	12	18	7		
19939:	1150	3743193	213793	4653	93383	268	100	ALL
	▪	924	41	5	64	12		
19940:	1175	2794229	159890	3513	69817	202	100	ALL
	▪	1206	80	10	59	17		
19941:	1200	2125039	121475	2685	53287	166	100	ALL
	▪	746	58	24	31	23		
19942:	1225	4476099	252658	5577	112896	416	200	ALL
	▪	2427	164	18	50	7		
19943:	1250	3866618	216175	4784	95979	310	200	ALL
	▪	749	130	8	49	25		
19944:	1350	1637779	91285	1971	39812	119	100	ALL
	▪	1384	86	16	37	21		
19945:	1450	554246	30413	733	13566	75	200	ALL
	▪	43	21	7	33	11		

38Ar errors assigned from experience, rest calculated from regression statistics

C O R R E C T I O N S

TEMP	39Ar	37Ar	-----K-derived----			----Ca-derived----			Cl-der	Initial
C	Decay	Decay	40Ar	38Ar	37Ar	39Ar	38Ar	36Ar	36Ar	38Ar
850	10	12287	69	164	0	9	0	4	0	24
950	12	33606	83	197	0	25	1	10	0	22
1000	18	127980	127	300	0	96	5	38	0	27
1050	82	633319	567	1337	0	475	22	186	0	29
1100	75	379673	521	1229	0	285	13	112	0	11
1125	138	666714	958	2259	0	500	24	196	0	9
1150	175	833095	1213	2861	0	625	29	245	0	4
1175	131	623708	907	2140	0	468	22	184	0	4
1200	99	476369	689	1626	0	357	17	140	0	5
1225	207	1010168	1433	3381	0	758	36	297	0	22
1250	177	859391	1226	2893	0	645	30	253	0	11
1350	75	356720	518	1222	0	268	13	105	0	3
1450	25	121635	173	407	0	91	4	36	0	7

All values in counts, corrected for mass discrimination

	TEMP C	% TOT 39Ar	RAD YIELD	APP K/Ca	APP K/Cl	F	AGE (Ma)		precision intra-sample	precision intra-package	precision inter-package
A	850	.3	87.1	.46	415	21.062	321.84	▪	.97	1.77	2.31
B	950	.4	88.4	.20	383	18.147	280.57	▪	3.83	4.04	4.25
C	1000	.6	90.6	.08	301	18.628	287.44	▪	3.24	3.51	3.75
D	1050	2.5	97.6	.07	272	18.789	289.74	▪	.53	1.45	1.97
E	1100	9.1	99.0	.11	288	18.253	282.09	▪	.57	1.43	1.94
F	1125	16.7	99.5	.12	284	17.798	275.56	▪	.23	1.30	1.83
G	1150	21.2	99.8	.12	291	17.492	271.17	▪	.26	1.29	1.80
H	1175	15.8	99.8	.12	284	17.457	270.67	▪	.47	1.35	1.84
I	1200	12.0	99.6	.12	279	17.446	270.50	▪	.81	1.50	1.95
J	1225	6.3	99.2	.12	279	17.593	272.62	▪	.18	1.28	1.80
K	1250	5.4	99.6	.12	278	17.826	275.96	▪	.49	1.38	1.88
L	1350	9.0	99.7	.12	297	17.913	277.21	▪	1.02	1.64	2.09
M	1450	.8	97.9	.12	223	17.855	276.38	▪	1.58	2.03	2.41

Total gas K/Ca = .1

Precisions are 1 sigma, measured in Ma. Measured 40/36 atm = 296.5 ▪.5
J = 0.009273 ▪ 0.50% (intra-package) ▪ 0.50% (inter-package)
Trap current factors- 40: 8.6 100: 4 200: 1
Manifold factors- ALL: 1 SPLIT 1: 3.515 SPLIT 2: 12.355 SPLIT 3: 35.937
EALL: 2 ESPLIT 1: 6.6 ESPLIT 2: 21.78
Sensitivity = 6.460E-18 % Reproducibility = .25 Detection limit = 40 counts
Data reduced assuming initial 40/36 = 295.50 ▪ 0.00
Ca-factors: 3637=2.6E-04▪1.7E-06 3837=3.2E-05▪2.4E-07 3937=6.7E-04▪3.7E-06
K-factors: 3739=0.0E+00▪2.2E-03 3839=1.3E-02▪2.4E-04 4039=5.7E-03▪4.0E-03

v 06/13/92 00:08:12 9 Jan 1993

88-328 #40,41,42 HBL RD59

J = 0.009273 ▪ 0.50% SAMPLE WT = 0.9995 g

TEMP C	Initial & radiogenic 40Ar	Potassium derived 39Ar	Chlorine derived 38Ar	Calcium derived 37Ar	Initial 36Ar	AGE* in Ma	**
850	1.907E-12	7.885E-14	4.593E-16	8.854E-14	8.333E-16	321.84 ▪	.97
950	1.946E-12	9.478E-14	5.985E-16	2.421E-13	7.649E-16	280.57 ▪	3.83
1000	2.973E-12	1.446E-13	1.164E-15	9.221E-13	9.490E-16	287.44 ▪	3.24
1050	1.240E-11	6.445E-13	5.738E-15	4.562E-12	9.941E-16	289.74 ▪	.53
1100	4.368E-11	2.369E-12	1.993E-14	1.094E-11	1.485E-15	282.09 ▪	.57
1125	7.790E-11	4.356E-12	3.717E-14	1.921E-11	1.241E-15	275.56 ▪	.23
1150	9.669E-11	5.517E-12	4.585E-14	2.400E-11	***	271.17 ▪	.26
1175	7.218E-11	4.126E-12	3.516E-14	1.797E-11	***	270.67 ▪	.47
1200	5.489E-11	3.135E-12	2.718E-14	1.372E-11	***	270.50 ▪	.81
1225	2.891E-11	1.630E-12	1.416E-14	7.273E-12	7.758E-16	272.62 ▪	.18
1250	2.497E-11	1.395E-12	1.215E-14	6.187E-12	3.709E-16	275.96 ▪	.49
1350	4.231E-11	2.356E-12	1.919E-14	1.027E-11	***	277.21 ▪	1.02
1450	3.579E-12	1.962E-13	2.132E-15	8.756E-13	***	276.38 ▪	1.58
TOTAL GAS	4.643E-10	2.604E-11	2.209E-13	1.163E-10	9.816E-15	274.42	

NO PLATEAU

Note: all gas quantities are in moles. No blank correction.

* Ages calculated assuming initial 40Ar/36Ar = 295.5 ▪ 0

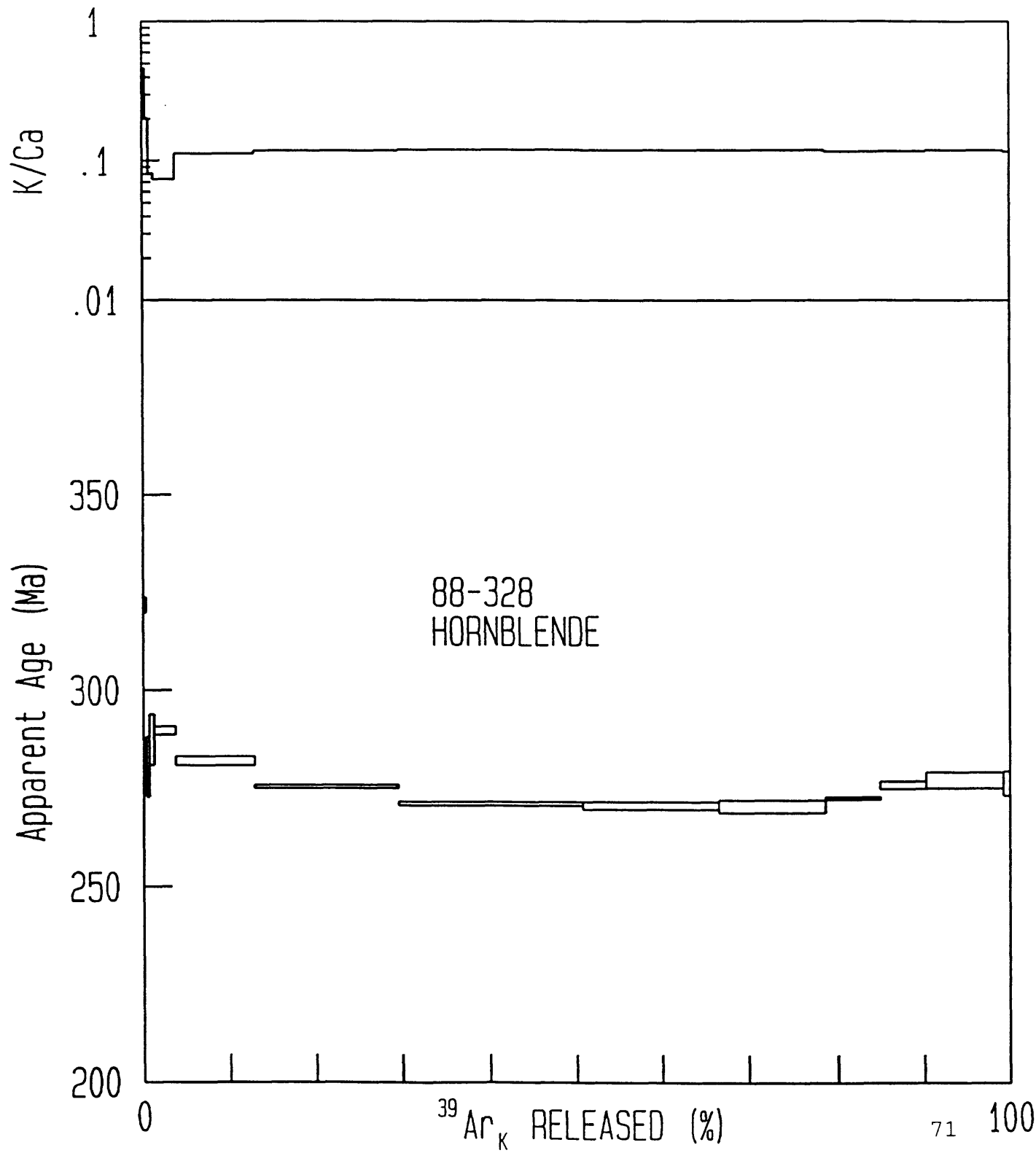
** 1-sigma precision estimates are for intra-sample reproducibility.

** 1-sigma precision estimates for plateaux are for intra-irradiation package reproducibility.

*** below detection limit

v 06/13/92

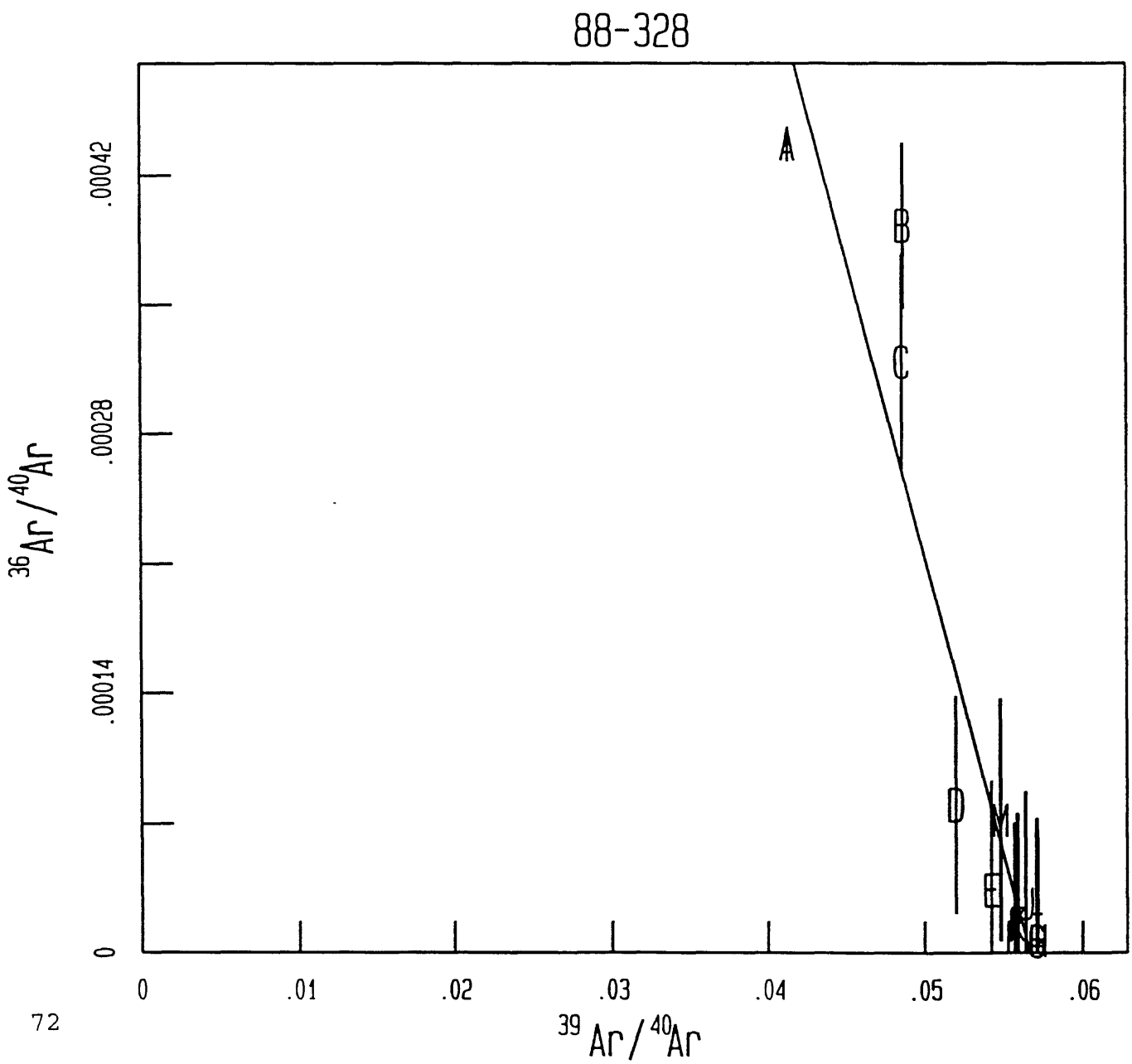
v 06/13/92 00:09:02 9 Jan 1993 88-328 #40,41,42 HBL RD59



v 06/13/92 (40/36in = 295.5)

v 06/13/92 00:23:57 9 Jan 1993 88-328 #40,41,42 HBL RD59

Points AB deleted;
 11 points regressed out of 13 includes 99.3 % of 39Ar
Mean X = .549E-01 Mean Y = .557E-04 Slope = -.323E-01 ä+Ç .714E-02
36/40 = .183E-02 ä+Ç .393E-03 39/40 = .567E-01 ä+Ç .722E-03
Fit parameters: SUMS = 3.85 MSWD = .428
40Ar/36Ar = 546.19 ä+Ç 117.19 F = 17.65 ä+Ç .225 AGE = 273.43 ä+Ç 3.47 Ma



W/O POINTS AB

R A W D A T A

FILE	TEMP	40Ar	39Ar	38Ar	37Ar	36Ar ä regression	TRAP CURRENT	MANIFOLD OPTION
19238:	750	370714	15277	1380	11564	274	200	SPLIT 1
	▪	233	40	20	23	27		
19239:	850	234276	10035	392	4061	238	200	ALL
	▪	54	10	22	6	15		
19240:	950	609474	31059	1976	34133	258	200	ALL
	▪	226	26	13	27	13		
19241:	1000	3260844	180375	14122	227618	522	200	ALL
	▪	2586	144	32	203	15		
19244:	1050	638525	35510	2820	43371	75	200	SPLIT 2
	▪	106	13	24	29	20		
19246:	1075	3514967	196187	15677	237405	311	200	SPLIT 1
	▪	1738	107	17	180	17		
19248:	1100	1436669	81063	6442	97516	75	100	SPLIT 1
	▪	839	67	10	83	7		
19249:	1125	4653988	263486	21237	315180	326	100	ALL
	▪	116	267	36	49	12		
19252:	1150	2873079	162607	13135	195469	195	100	ALL
	▪	939	63	14	26	4		
19253:	1175	1569681	88047	7126	106135	134	100	ALL
	▪	590	16	11	42	13		
19254:	1200	2929691	162000	13173	195459	296	200	ALL
	▪	2334	132	9	153	19		
19255:	1250	4321317	237711	19341	284059	352	200	ALL
	▪	2301	125	26	166	8		
19256:	1350	978371	53086	4229	62899	114	200	ALL
	▪	390	21	40	11	9		

38Ar errors assigned from experience, rest calculated from regression statistics

C O R R E C T I O N S

TEMP |C	39Ar Decay	37Ar Decay	-----K-derived---- 40Ar	38Ar	37Ar	----Ca-derived---- 39Ar	38Ar	36Ar	Cl-der 36Ar	Initial 38Ar
750	6	25047	87	205	0	25	1	10	0	50
850	4	8803	57	135	0	9	0	3	0	44
950	12	74065	176	416	0	73	3	29	0	43
1000	71	499424	1023	2413	0	491	23	192	1	62
1050	14	95333	201	475	0	94	4	37	0	7
1075	78	522460	1113	2625	0	513	24	201	1	20
1100	32	214861	460	1085	0	211	10	83	1	-1
1125	105	695281	1495	3526	0	682	32	267	2	11
1150	65	431847	922	2176	0	423	20	166	1	5
1175	35	234692	499	1178	0	230	11	90	1	8
1200	65	432728	919	2168	0	424	20	166	1	24
1250	95	629444	1348	3181	0	616	29	242	2	21
1350	21	139502	301	710	0	137	6	54	0	11

All values in counts, corrected for mass discrimination

v 06/13/92 88-330 #43,44,45 HBL RD59 05:18:19 8 Jan 1993

	TEMP C	% TOT 39Ar	RAD YIELD	APP K/Ca	APP K/Cl	F	AGE (Ma)		precision intra-sample	precision intra-package	precision inter-package
A	750	1.1	78.9	.22	30	19.144	293.67	▪	7.34	7.46	7.59
B	850	.2	70.3	.40	80	16.396	254.35	▪	6.31	6.43	6.54
C	950	.6	88.9	.15	47	17.451	269.54	▪	1.82	2.22	2.55
D	1000	3.6	97.0	.13	37	17.558	271.07	▪	.41	1.33	1.83
E	1050	8.7	98.2	.13	36	17.678	272.79	▪	2.42	2.73	3.01
F	1075	13.6	99.1	.13	36	17.771	274.12	▪	.39	1.33	1.84
G	1100	22.6	100.0	.13	37	17.770	274.11	▪	.37	1.33	1.84
H	1125	20.9	99.6	.14	36	17.617	271.92	▪	.19	1.28	1.80
I	1150	12.9	99.7	.13	36	17.635	272.18	▪	.13	1.27	1.80
J	1175	7.0	99.2	.13	36	17.699	273.10	▪	.64	1.42	1.91
K	1200	3.2	98.7	.13	35	17.867	275.50	▪	.54	1.39	1.89
L	1250	4.7	99.2	.13	35	18.061	278.27	▪	.20	1.31	1.84
M	1350	1.1	98.2	.14	36	18.111	278.99	▪	.71	1.48	1.97

Total gas K/Ca = .1

Precisions are 1 sigma, measured in Ma. Measured 40/36 atm = 296.5 ▪.5
J = 0.009235 ▪ 0.50% (intra-package) ▪ 0.50% (inter-package)
Trap current factors- 40: 8.6 100: 4 200: 1
Manifold factors- ALL: 1 SPLIT 1: 3.515 SPLIT 2: 12.355 SPLIT 3: 35.937
EALL: 2 ESPLIT 1: 6.6 ESPLIT 2: 21.78
Sensitivity = 6.460E-18 % Reproducibility = .25 Detection limit = 40 counts
Data reduced assuming initial 40/36 = 295.50 ▪ 0.00
Ca-factors: 3637=2.6E-04▪1.7E-06 3837=3.2E-05▪2.4E-07 3937=6.7E-04▪3.7E-06
K-factors: 3739=0.0E+00▪2.2E-03 3839=1.3E-02▪2.4E-04 4039=5.7E-03▪4.0E-03

v 06/13/92 05:18:24 8 Jan 1993

88-330 #43,44,45 HBL RD59

J = 0.009235 ▪ 0.50% SAMPLE WT = 0.9781 g

TEMP C	Initial & radiogenic 40Ar	Potassium derived 39Ar	Chlorine derived 38Ar	Calcium derived 37Ar	Initial 36Ar	AGE* in Ma	**
750	8.416E-12	3.468E-13	2.783E-14	8.334E-13	6.015E-15	293.67 ▪	7.34
850	1.513E-12	6.485E-14	1.950E-15	8.331E-14	1.522E-15	254.35 ▪	6.31
950	3.936E-12	2.004E-13	1.036E-14	7.007E-13	1.484E-15	269.54 ▪	1.82
1000	2.106E-11	1.163E-12	7.604E-14	4.709E-12	2.132E-15	271.07 ▪	.41
1050	5.095E-11	2.830E-12	1.878E-13	1.110E-11	***	272.79 ▪	2.42
1075	7.979E-11	4.449E-12	2.969E-13	1.730E-11	2.481E-15	274.12 ▪	.39
1100	1.304E-10	7.353E-12	4.866E-13	2.844E-11	***	274.11 ▪	.37
1125	1.202E-10	6.799E-12	4.580E-13	2.618E-11	1.486E-15	271.92 ▪	.19
1150	7.422E-11	4.196E-12	2.834E-13	1.625E-11	***	272.18 ▪	.13
1175	4.055E-11	2.272E-12	1.539E-13	8.829E-12	1.130E-15	273.10 ▪	.64
1200	1.892E-11	1.045E-12	7.127E-14	4.068E-12	8.364E-16	275.50 ▪	.54
1250	2.791E-11	1.534E-12	1.046E-13	5.916E-12	7.103E-16	278.27 ▪	.20
1350	6.318E-12	3.425E-13	2.281E-14	1.311E-12	3.911E-16	278.99 ▪	.71
TOTAL GAS	5.842E-10	3.260E-11	2.181E-12	1.257E-10	2.202E-14	273.45	

NO PLATEAU

Note: all gas quantities are in moles. No blank correction.

* Ages calculated assuming initial 40Ar/36Ar = 295.5 ▪ 0

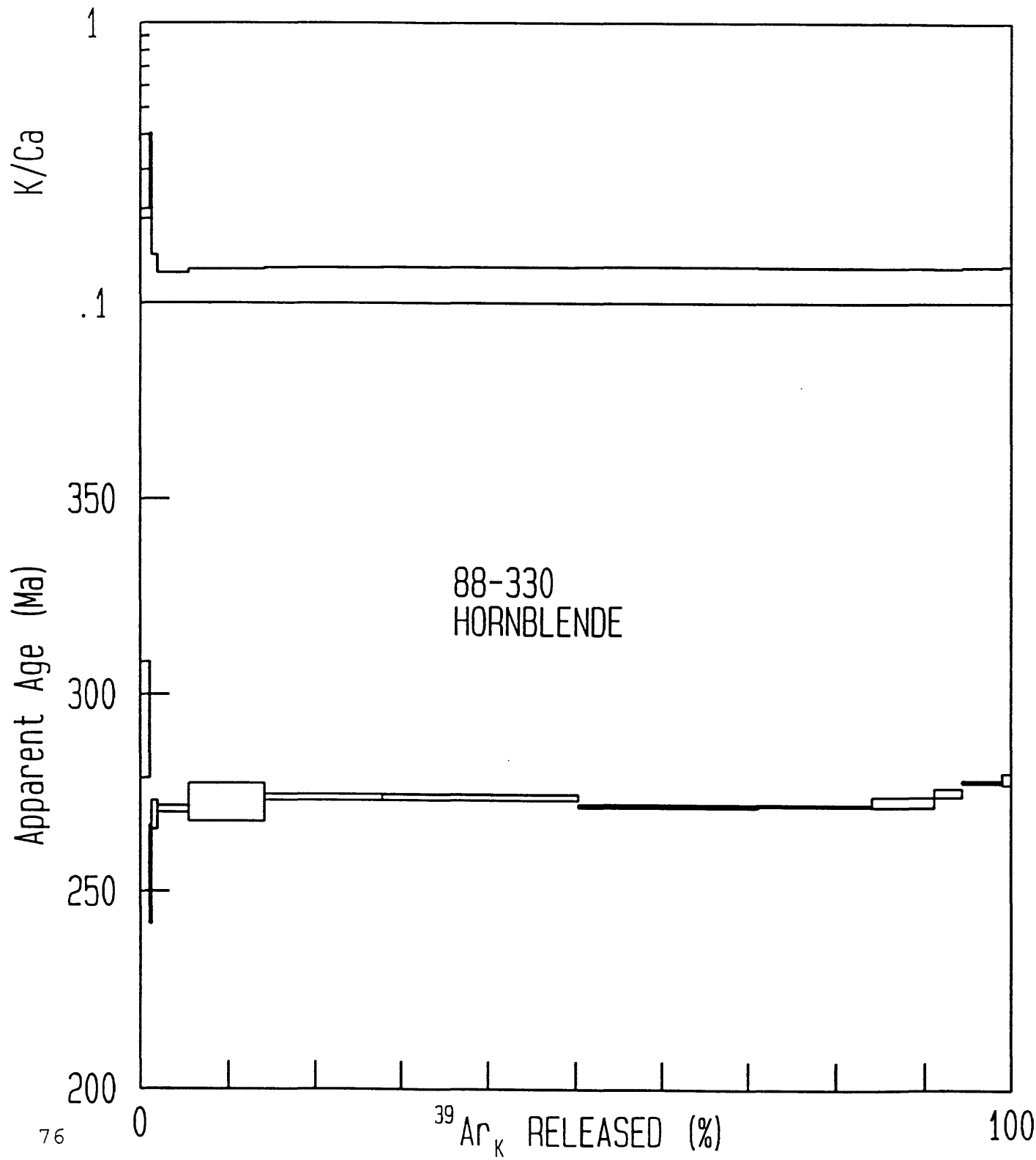
** 1-sigma precision estimates are for intra-sample reproducibility.

** 1-sigma precision estimates for plateaux are for intra-irradiation package reproducibility.

*** below detection limit

v 06/13/92

v 06/13/92 05:22:05 8 Jan 1993 88-330 #43,44,45 HBL RD59



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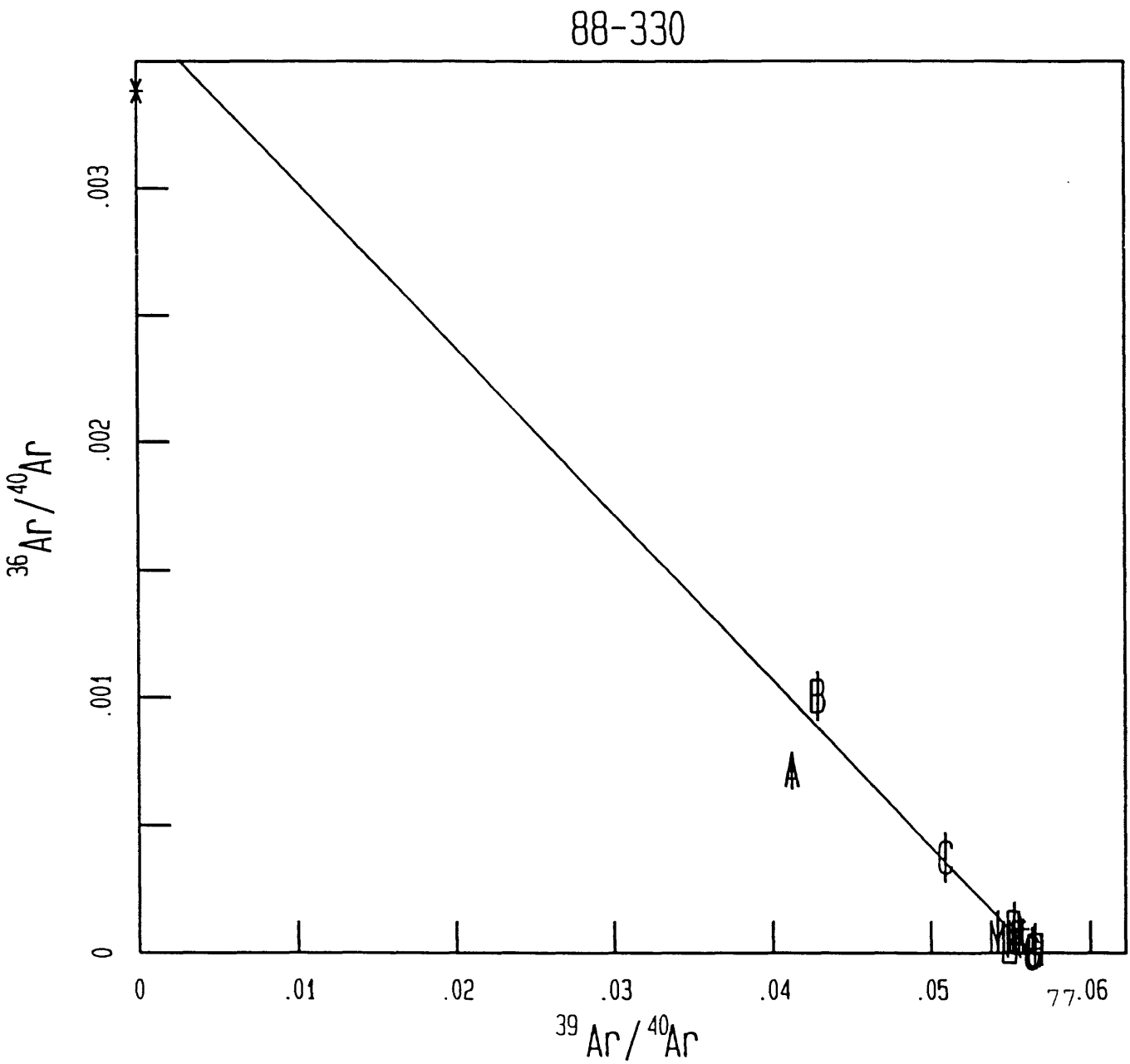
v 06/13/92

(40/36in = 295.5)

v 06/13/92 05:58:18 8 Jan 1993 88-330 #43,44,45 HBL RD59

Points ABM deleted;
 10 points regressed out of 13 includes 97.7 % of 39Ar
Mean X = .553E-01 Mean Y = .729E-04 Slope = -.661E-01 ä+Ç .202E-01
36/40 = .372E-02 ä+Ç .112E-02 39/40 = .564E-01 ä+Ç .610E-03
Fit parameters: SUMS = .731 MSWD = .091
40Ar/36Ar = 268.47 ä+Ç 80.38 F = 17.74 ä+Ç .192 AGE = 273.68 ä+Ç 3.03 Ma



W/O POINTS ABM

88-331 HORNBLENIE RD59 #37-39

R A W D A T A

FILE	TEMP	40Ar	39Ar	38Ar	37Ar	36Ar regression	TRAP CURRENT	MANIFOLD OPTION
	750	228803	8102	413	86	189	200	ALL
	±	132	18	12	4	6		
	850	189735	10330	390	106	115	200	ALL
	±	147	18	14	13	1[illegible]		
	950	1419259	80369	8422	2098	240	200	ALL
	±	694	32	18	9	12		
	1000	3472470	201225	21078	5268	389	200	ALL
	±	1593	56	10	17	12		
	1050	2946673	171053	17663	4434	263	200	SPLIT 1
	±	318	59	11	6	10		
	1100	2708458	156096	15066	4084	194	100	SPLIT 1
	±	913	30	10	21	1[illegible]		
	1125	2417735	139240	13175	3679	187	100	ALL
	±	993	32	9	12	8		
	1150	3386521	195107	18705	5117	287	200	ALL
	±	1288	19	12	4	8		
	1175	1734689	99516	9694	2589	165	200	ALL
	±	913	81	35	15	15		

38Ar errors assigned from experience, rest calculated from regression statistics

C O R R E C T I O N S

TEMP °C	39Ar Decay	37Ar Decay	-----K-derived---- 40Ar	38Ar	37Ar	----Ca-derived---- 39Ar	38Ar	36Ar	Cl-der 36Ar	Initial 38Ar
750	15	12119	46	109	0	8	0	3	0	35
850	19	14947	59	139	0	10	0	4	0	21
950	145	296013	457	1077	0	201	9	79	4	30
1000	364	743893	1143	2697	0	505	24	198	9	34
1050	309	626773	972	2292	0	426	20	167	7	17
1100	282	578016	887	2092	0	393	18	154	6	6
1125	252	521020	791	1866	0	354	17	139	5	8
1150	353	725119	1108	2615	0	493	23	193	8	16
1175	180	367034	565	1334	0	249	12	98	4	12

All values in counts, corrected for mass discrimination

88-331 HORNBLENDE PD59 #37-39

	TEMP C	% TOT 39Ar	RAD YIELD	APP K/Ca	APP K/Cl	F	AGE (Ma)		precision intra-sample	precision intra-package	precision inter-package
A	750	.6	75.9	.34	58	21.407	326.92	±	3.14	3.49	3.80
B	850	.7	82.7	.36	92	15.153	237.38	±	4.65	4.79	4.92
C	950	5.8	96.7	.14	26	17.069	265.28	±	.66	1.40	1.87
D	1000	14.5	98.4	.14	26	16.979	263.99	±	.29	1.27	1.77
E	1050	44.4	99.1	.14	27	17.064	265.21	±	.27	1.27	1.77
F	1100	10.1	99.6	.14	29	17.278	268.31	±	.32	1.29	1.80
G	1125	2.5	99.5	.14	30	17.264	268.11	±	.27	1.28	1.79
H	1150	14.1	99.2	.14	29	17.218	267.43	±	.20	1.26	1.77
I	1175	7.2	98.9	.14	29	17.234	267.67	±	.69	1.43	1.89

Total gas K/Ca = .1

Precisions are 1 sigma, measured in Ma. Measured 40/36 atm = 296.5 ±.5
J = 0.009281 ± 0.50% (intra-package) ± 0.50% (inter-package)
Trap current factors- 40: 8.6 100: 4 200: 1
Manifold factors- ALL: 1 SPLIT 1: 3.6 SPLIT 2: 12.96 SPLIT 3: 46.656
Sensitivity = 6.470E-18 Detection limit = 40 counts
Data reduced assuming initial 40/36 = 295.50 ± 0.00
Ca-factors: 3637=2.6E-04±1.7E-06 3837=3.2E-05±2.4E-07 3937=6.7E-04±3.7E-06
K-factors: 3739=0.0E+00±2.2E-03 3839=1.3E-02±2.4E-04 4039=5.7E-03±4.6E-03

J = 0.009281 ± 0.50% SAMPLE WT = 1.0011 g

TEMP C	Initial & radiogenic 40Ar	Potassium derived 39Ar	Chlorine derived 38Ar	Calcium derived 37Ar	Initial 36Ar	AGE* in Ma		**
750	1.480E-12	5.251E-14	2.196E-15	7.917E-14	1.205E-15	326.92	±	3.49
850	1.227E-12	6.695E-14	1.762E-15	9.764E-14	7.200E-16	237.38	±	4.79
950	9.180E-12	5.201E-13	4.775E-14	1.934E-12	1.025E-15	265.28	±	1.40
1000	2.246E-11	1.302E-12	1.192E-13	4.859E-12	1.186E-15	263.99	±	1.27
1050	6.861E-11	3.985E-12	3.587E-13	1.474E-11	2.084E-15	265.21	±	1.27
1100	1.577E-11	9.091E-13	7.564E-14	3.398E-12	***	268.31	±	1.29
1125	3.909E-12	2.252E-13	1.832E-14	8.509E-13	7.014E-17	268.11	±	1.28
1150	2.190E-11	1.263E-12	1.043E-13	4.737E-12	5.630E-16	267.43	±	1.26
1175	1.122E-11	6.440E-13	5.421E-14	2.398E-12	4.124E-16	267.67	±	1.43
TOTAL GAS	1.558E-10	8.967E-12	7.821E-13	3.309E-11	7.466E-15	266.07		

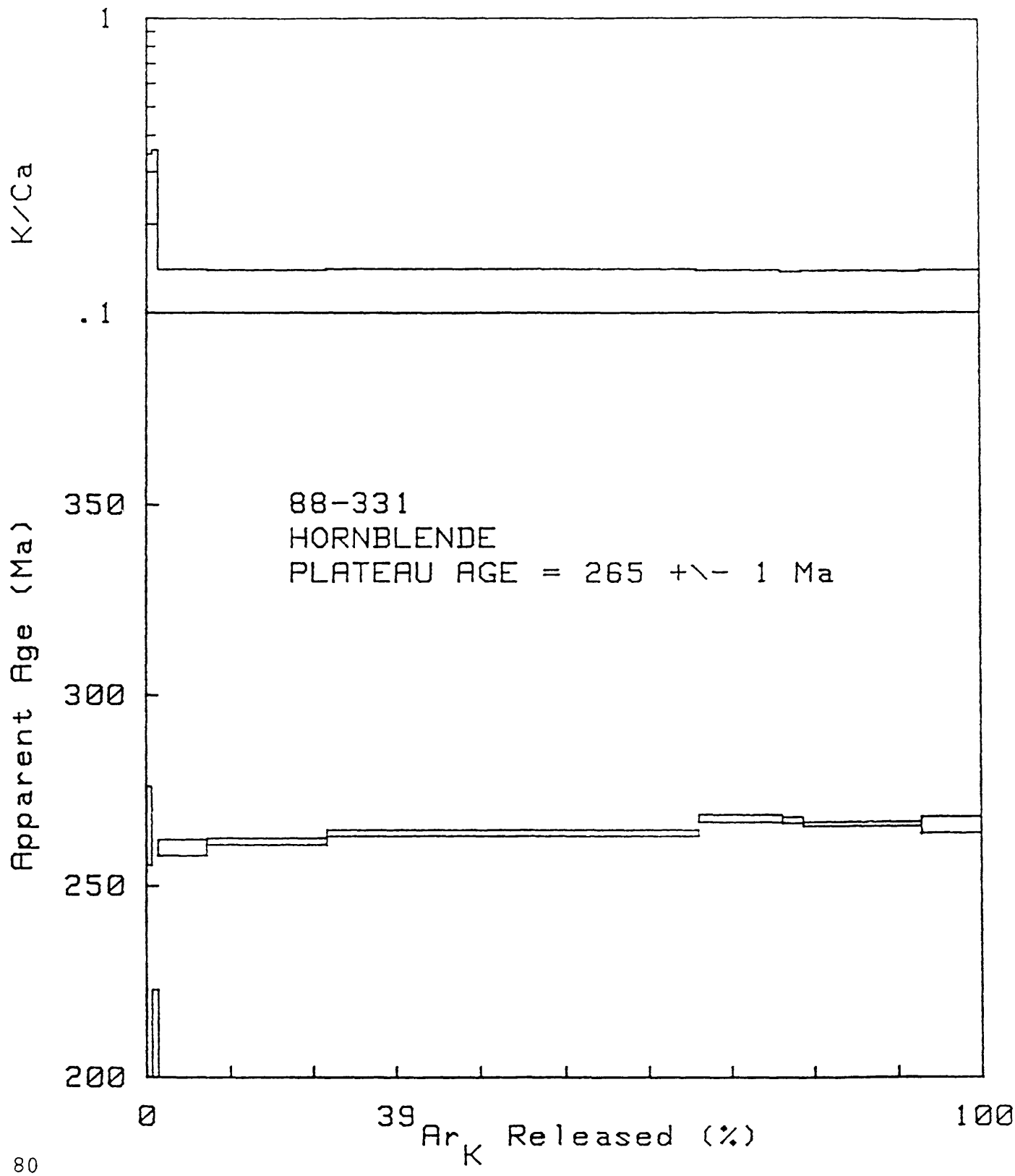
K/Ca = .1

64.8% of gas or plateau, steps 950 through 1050 PLATEAU AGE = 264.70 ± 1.38

Note: all gas quantities are in moles. No blank correction.
* Ages calculated assuming initial 40Ar/36Ar = 295.5 ± 0
** 1-sigma precision estimates are for intra-irradiation package reproducibility.
*** below detection limit

v 3/28/90

v 3/28/90



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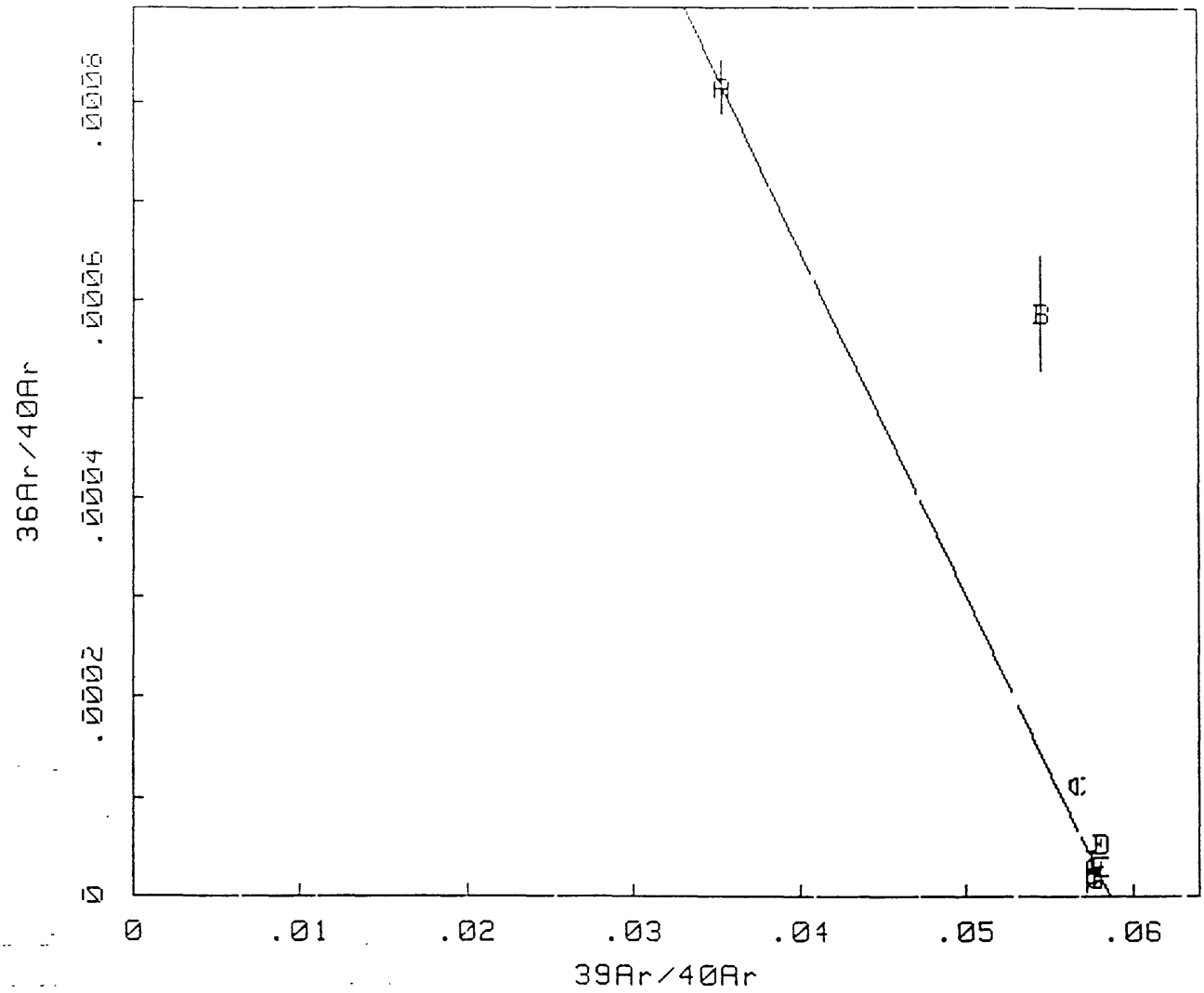
v 3/28/9088-331 HORNBLENDE RD59 #37-39 (40/361n = 483.3)



9 points regressed out of 9
Mean X = .577E-01 Mean Y = .331E-04 Slope = -.353E-01 ± .16E-02
36/40 = .207E-02 ± .670E-04 39/40 = .586E-01 ± .545E-04
Fit parameters: SUMS = 224.502 MSWD = 32.072
40Ar/36Ar = 483.28 ± 15.65 F = 17.064 ± .016 AGE = 265.22 ± 1.25 Ma

R A W D A T A

FILE	TEMP	40Ar	39Ar	38Ar	37Ar	36Ar ä regression	TRAP CURRENT	MANIFOLD OPTION
32639	1100	349171	17633	2183	37940	59	200	EALL
	▪	390	11	4	42	5		
32640	1125	1104891	57261	7505	119138	111	200	EALL
	▪	1660	97	18	245	7		
32641	1150	2517545	131226	15788	272750	218	200	EALL
	▪	3403	143	36	370	12		
32642	1170	2631691	138576	15096	293843	228	200	EALL
	▪	3202	183	24	729	10		
32643	1185	2969949	157621	16237	337314	247	200	EALL
	▪	3322	149	17	307	3		
32644	1200	3545457	187009	18210	392790	264	200	EALL
	▪	8183	426	17	808	9		
32645	1225	4709789	257116	16390	606593	389	200	EALL
	▪	8988	408	24	1429	8		
32646	1250	3671588	205364	11258	514115	336	200	EALL
	▪	4459	224	8	469	7		
32647	1450	2254565	124292	7998	297549	196	200	ESPLIT
	▪	2404	106	21	231	8		

C O R R E C T I O N S

TEMP	39Ar	37Ar	-----K-derived----			----Ca-derived----			Cl-der	Initial
C	Decay	Decay	40Ar	38Ar	37Ar	39Ar	38Ar	36Ar	36Ar	38Ar
1100	4	36939	100	236	0	51	2	20	0	7
1125	14	116103	325	766	0	159	7	62	0	9
1150	31	266054	744	1755	0	364	17	143	1	14
1170	33	286900	786	1854	0	392	18	154	1	14
1185	37	329654	894	2108	0	450	21	177	1	13
1200	44	384233	1060	2502	0	524	25	206	1	11
1225	61	593939	1457	3438	0	810	38	318	1	13
1250	49	503864	1164	2746	0	687	32	269	1	13
1450	30	291947	704	1662	0	398	19	156	0	7

All values in counts, corrected for mass discrimination

v 06/13/92 91-543 #37,38,39 RD87 04:18:52 23 Jan 1993

TEMP C	% TOT 39Ar	RAD YIELD	APP K/Ca	APP K/Cl	F	AGE (Ma)	precision intra-sample	precision intra-package	precision inter-package
A 1100	1.1	96.7	.12	22	19.172	287.34 ▪	1.22	1.81	2.25
B 1125	3.7	98.7	.13	20	19.073	285.96 ▪	.64	1.47	1.98
C 1150	8.4	99.1	.13	23	19.042	285.54 ▪	.53	1.43	1.94
D 1170	8.9	99.2	.12	25	18.861	283.02 ▪	.43	1.38	1.91
E 1185	10.1	99.3	.12	27	18.737	281.31 ▪	.30	1.34	1.87
F 1200	12.0	99.5	.12	29	18.894	283.48 ▪	.64	1.46	1.97
G 1225	16.5	99.5	.11	48	18.267	274.75 ▪	.51	1.38	1.88
H 1250	13.1	99.5	.10	58	17.816	268.45 ▪	.33	1.30	1.80
I 1450	26.3	99.5	.11	47	18.077	272.10 ▪	.39	1.33	1.83

Total gas K/Ca = .1

Precisions are 1 sigma, measured in Ma. Measured 40/36 atm = 296.5 ▪.5
J = 0.009006 ▪ 0.50% (intra-package) ▪ 0.50% (inter-package)
Trap current factors- 40: 5.66 100: 2.26 200: 1
Manifold factors- ALL: 1 SPLIT 1: 3.51 SPLIT 2: 10.89 SPLIT 3: 35.937
EALL: 2 ESPLIT 1: 6.6 ESPLIT 2: 21.78
Sensitivity = 1.344E-17 % Reproducibility = .25 Detection limit = 40 counts
Data reduced assuming initial 40/36 = 295.50 ▪ 0.00
Ca-factors: 3637=2.6E-04▪1.7E-06 3837=3.2E-05▪2.4E-07 3937=6.7E-04▪3.7E-06
K-factors: 3739=0.0E+00▪2.2E-03 3839=1.3E-02▪2.4E-04 4039=5.7E-03▪4.0E-03

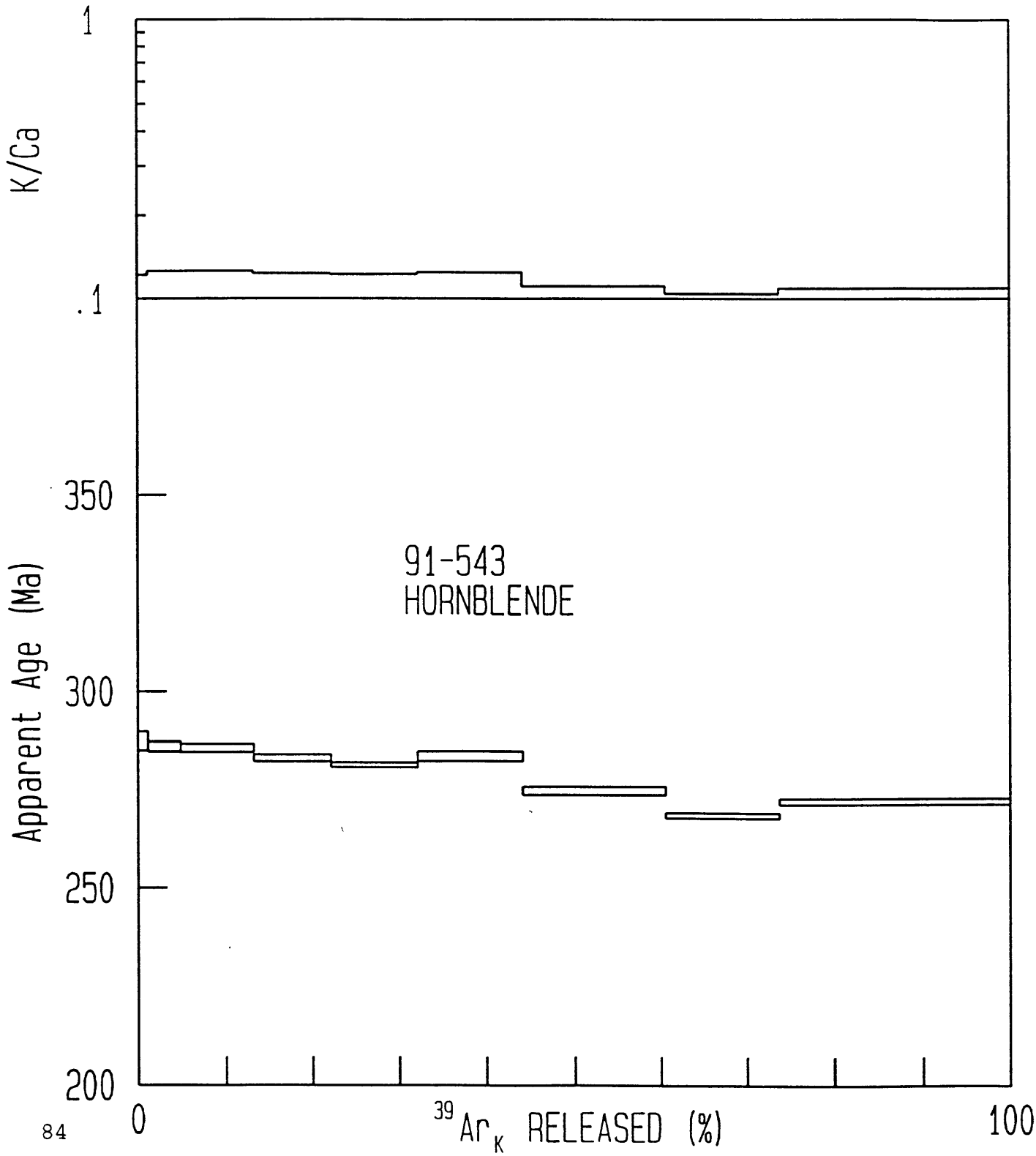
J = 0.009006 ▪ 0.50% SAMPLE WT = 0.9833 g

TEMP C	Initial & radiogenic 40Ar	Potassium derived 39Ar	Chlorine derived 38Ar	Calcium derived 37Ar	Initial 36Ar	AGE* in Ma	**
1100	9.383E-12	4.731E-13	5.258E-14	2.018E-12	***	287.34 ▪	1.22
1125	2.969E-11	1.537E-12	1.815E-13	6.339E-12	1.300E-15	285.96 ▪	.64
1150	6.765E-11	3.521E-12	3.778E-13	1.452E-11	2.017E-15	285.54 ▪	.53
1170	7.072E-11	3.718E-12	3.565E-13	1.565E-11	1.982E-15	283.02 ▪	.43
1185	7.981E-11	4.229E-12	3.803E-13	1.797E-11	1.899E-15	281.31 ▪	.30
1200	9.527E-11	5.018E-12	4.227E-13	2.094E-11	1.554E-15	283.48 ▪	.64
1225	1.266E-10	6.897E-12	3.482E-13	3.235E-11	1.937E-15	274.75 ▪	.51
1250	9.866E-11	5.508E-12	2.288E-13	2.743E-11	1.808E-15	268.45 ▪	.33
1450	1.999E-10	1.100E-11	5.622E-13	5.242E-11	***	272.10 ▪	.39
TOTAL GAS	7.777E-10	4.190E-11	2.911E-12	1.896E-10	1.709E-14	277.14	

NO PLATEAU

Note: all gas quantities are in moles. No blank correction.
* Ages calculated assuming initial 40Ar/36Ar = 295.5 ▪ 0
** 1-sigma precision estimates are for intra-sample reproducibility.
** 1-sigma precision estimates for plateaux are for intra-irradiation package reproducibility.
*** below detection limit

v 06/13/92 04:22:29 23 Jan 1993 91-543 #37,38,39 RD87

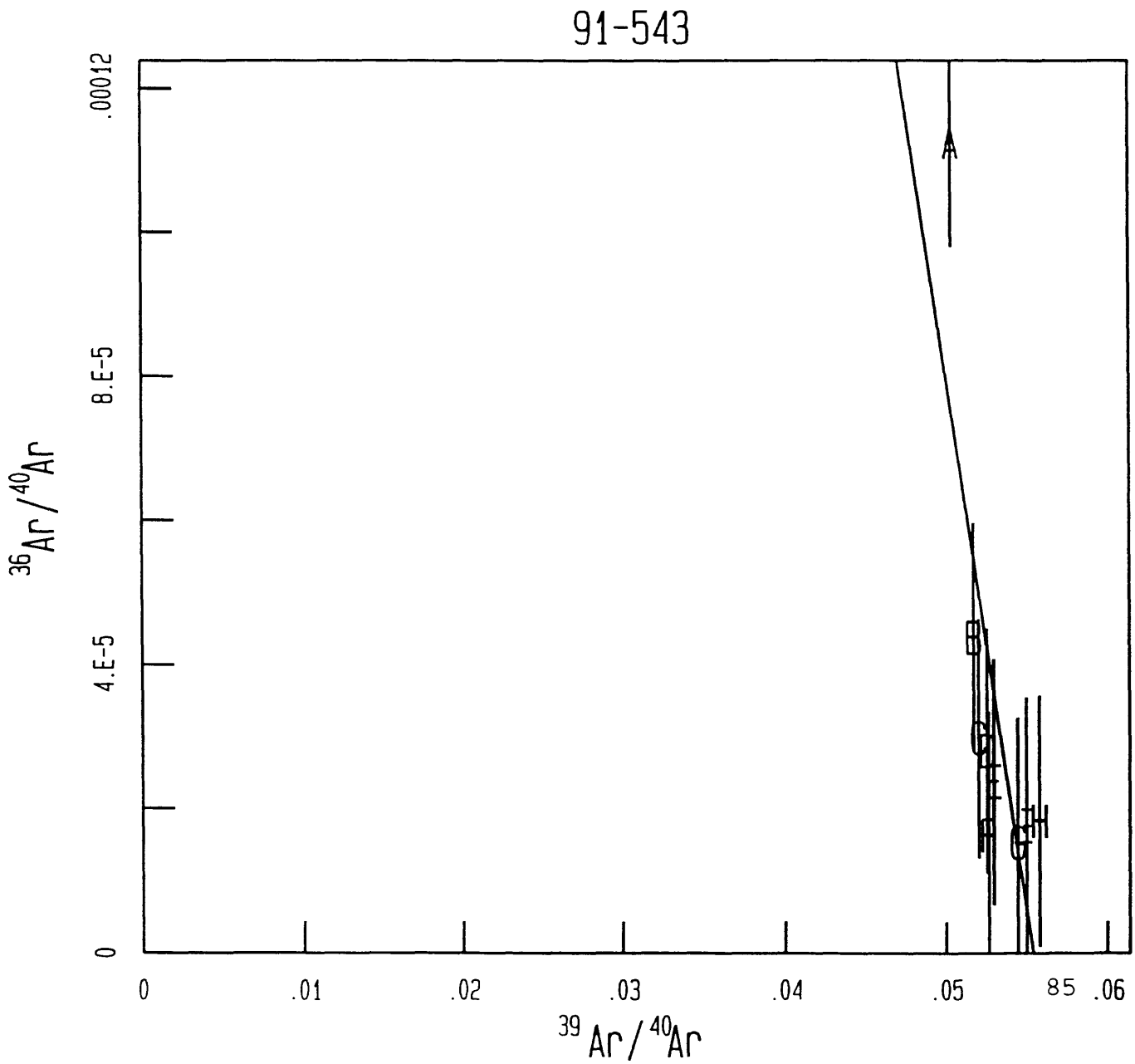


84

v 06/13/92 (40/36in = 295.5)

v 06/13/92 04:48:27 23 Jan 1993 91-543 #37,38,39 RD87

Point deleted;
9 points regressed out of 9
Mean X = .529E-01 Mean Y = .377E-04 Slope = -.149E-01 ä+Ç .340E-02
36/40 = .828E-03 ä+Ç .180E-03 39/40 = .554E-01 ä+Ç .757E-03
Fit parameters: SUMS = 14.316 MSWD = 2.045
40Ar/36Ar = 1207.56 ä+Ç 262.58 F = 18.04 ä+Ç .246 AGE = 271.58 ä+Ç 3.67 Ma



v 06/13/92 92-111 #58 RD91 05:53:50 23 Jan 1993

R A W D A T A

FILE	TEMP	40Ar	39Ar	38Ar	37Ar	36Ar ä regression	TRAP CURRENT	MANIFOLD OPTION
34869	900	254974	14767	136	18	96	200	EALL
	▪	171	9	9	12	6		
34870	950	458360	29757	381	0	25	200	EALL
	▪	207	15	15	12	6		
34871	1000	218973	14049	119	0	16	200	EALL
	▪	46	9	9	4	7		
34872	1075	165256	10440	83	14	24	200	EALL
	▪	89	10	19	17	5		
34873	1150	330076	21417	330	8	20	200	EALL
	▪	230	46	23	6	6		

C O R R E C T I O N S

TEMP |C	39Ar Decay	37Ar Decay	-----K-derived---- 40Ar	38Ar	37Ar	----Ca-derived---- 39Ar	38Ar	36Ar	Cl-der 36Ar	Initial 38Ar
900	10	91	84	198	0	0	0	0	-0	18
950	19	0	169	399	0	0	0	0	-0	5
1000	9	0	80	189	0	0	0	0	-0	3
1075	7	74	59	140	0	0	0	0	-0	4
1150	14	40	122	287	0	0	0	0	0	4

All values in counts, corrected for mass discrimination

	TEMP C	% TOT 39Ar	RAD YIELD	APP K/Ca	APP K/Cl	F	AGE (Ma)		precision intra-sample	precision intra-package	precision inter-package
A	900	16.3	88.8	70.82	0	15.304	244.68	▪	1.71	2.06	2.36
B	950	32.9	98.4	0.00	0	15.122	241.96	▪	.84	1.41	1.81
C	1000	15.5	97.8	0.00	0	15.222	243.46	▪	2.13	2.42	2.67
D	1075	11.5	95.7	61.46	0	15.122	241.96	▪	2.22	2.50	2.74
E	1150	23.7	98.2	234.09	1120	15.112	241.81	▪	1.29	1.72	2.06

Total gas K/Ca = 74.1

Precisions are 1 sigma, measured in Ma. Measured 40/36 atm = 296.5 ▪.5
J = 0.009492 ▪ 0.50% (intra-package) ▪ 0.50% (inter-package)
Trap current factors- 40: 5.66 100: 2.26 200: 1
Manifold factors- ALL: 1 SPLIT 1: 3.67 SPLIT 2: 10.89 SPLIT 3: 35.937
EALL: 2.1167 ESPLIT 1: 6.6 ESPLIT 2: 21.78
Sensitivity = 1.475E-17 % Reproducibility = .25 Detection limit = 40 counts
Data reduced assuming initial 40/36 = 295.50 ▪ 0.00
Ca-factors: 3637=2.6E-04▪1.7E-06 3837=3.2E-05▪2.4E-07 3937=6.7E-04▪3.7E-06
K-factors: 3739=0.0E+00▪2.2E-03 3839=1.3E-02▪2.4E-04 4039=5.7E-03▪4.0E-03

v 06/13/92 05:53:53 23 Jan 1993

92-111 #58 RD91

J = 0.009492 ▪ 0.50% SAMPLE WT = 0.0107 g

TEMP C	Initial & radiogenic 40Ar	Potassium derived 39Ar	Chlorine derived 38Ar	Calcium derived 37Ar	Initial 36Ar	AGE* in Ma	**
900	7.958E-12	4.617E-13	***	3.390E-15	3.018E-15	244.68 ▪	1.71
950	1.431E-11	9.304E-13	***	***	***	241.96 ▪	.84
1000	6.834E-12	4.393E-13	***	***	***	243.46 ▪	2.13
1075	5.158E-12	3.264E-13	***	2.762E-15	***	241.96 ▪	2.22
1150	1.030E-11	6.697E-13	1.447E-15	1.488E-15	***	241.81 ▪	1.29
TOTAL GAS	4.456E-11	2.828E-12	1.447E-15	7.640E-15	5.676E-15	242.60	

100.0% of gas on plateau, steps 900 through 1150 PLATEAU AGE = 242.38 + 1.27

Note: all gas quantities are in moles. No blank correction.

* Ages calculated assuming initial 40Ar/36Ar = 295.5 ▪ 0

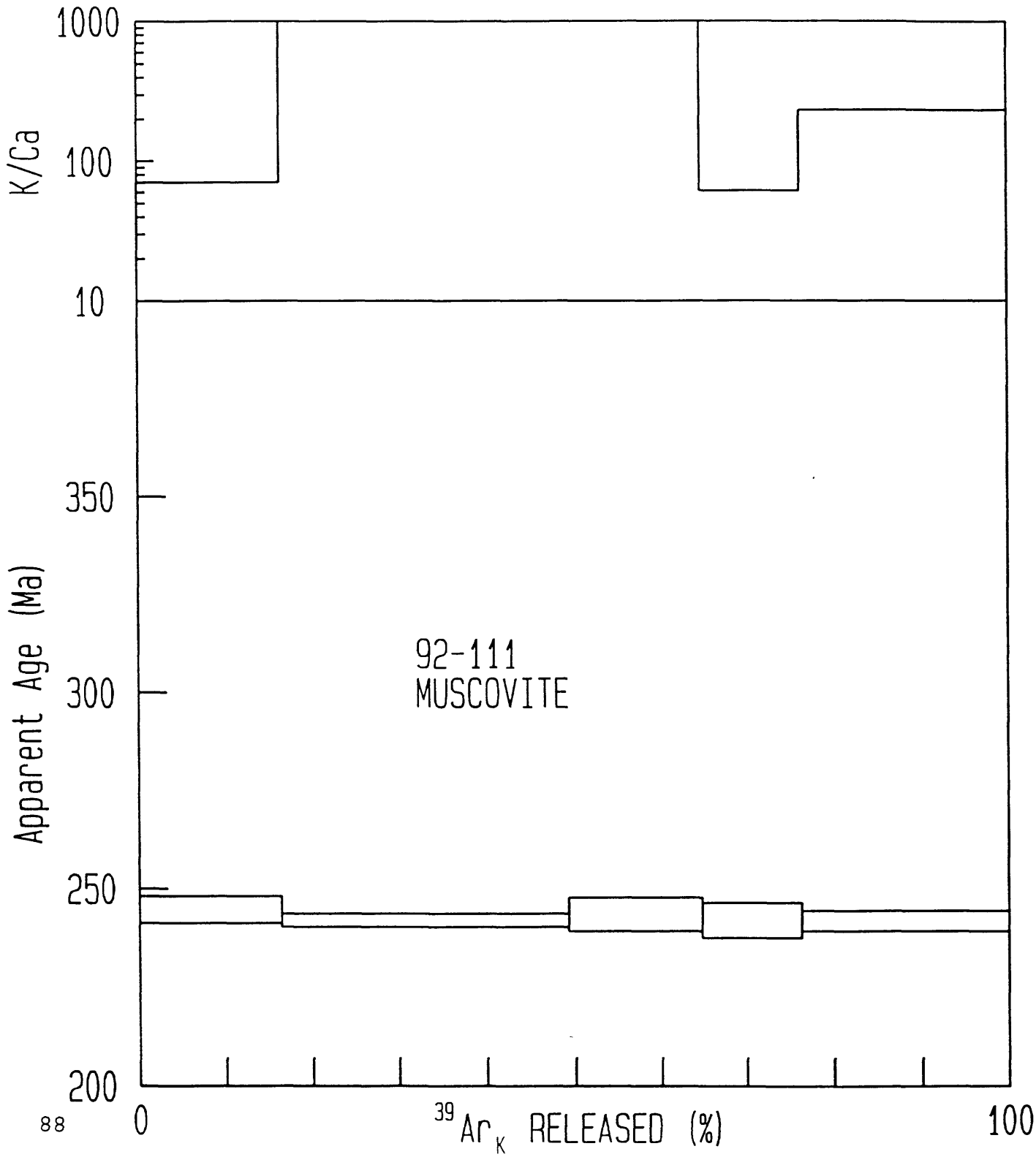
** 1-sigma precision estimates are for intra-sample reproducibility.

** 1-sigma precision estimates for plateaux are for intra-irradiation package reproducibility.

*** below detection limit

v 06/13/92

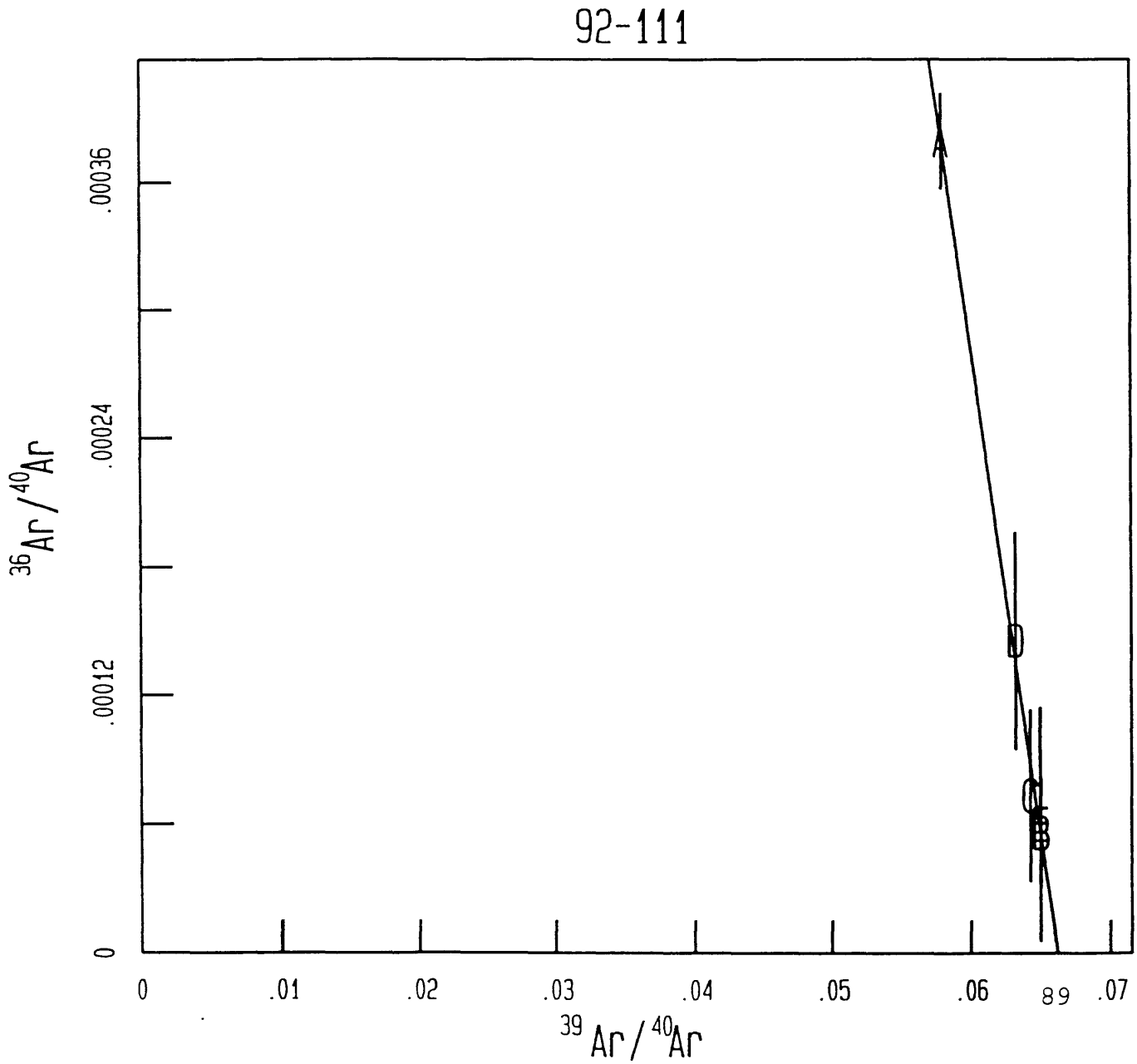
v 06/13/92 05:54:29 23 Jan 1993 92-111 #58 RD91



v 06/13/92 (40/36in = 295.5)

v 06/13/92 05:57:31 23 Jan 1993 92-111 #58 RD91

5 points regressed out of 5
Mean X = .619E-01 Mean Y = .198E-03 Slope = -.465E-01 ä+Ç .436E-02
36/40 = .307E-02 ä+Ç .271E-03 39/40 = .662E-01 ä+Ç .505E-03
Fit parameters: SUMS = .214 MSWD = .071
40Ar/36Ar = 325.2 ä+Ç 28.61 F = 15.11 ä+Ç .115 AGE = 241.77 ä+Ç 2.06 Ma



v 06/13/92 92-109 #54 RD91 06:20:11 23 Jan 1993

R A W D A T A

FILE	TEMP	40Ar	39Ar	38Ar	37Ar	36Ar	TRAP	MANIFOLD
					ä regression		CURRENT	OPTION
34847	1650	1327376	82420	1766	4	70	40	EALL
	▪	116	28	6	12	6		

C O R R E C T I O N S

TEMP	39Ar	37Ar	-----K-derived----			----Ca-derived----			Cl-der	Initial
C	Decay	Decay	40Ar	38Ar	37Ar	39Ar	38Ar	36Ar	36Ar	38Ar
1650	53	19	469	1106	0	0	0	0	0	13

All values in counts, corrected for mass discrimination

	TEMP C	% TOT 39Ar	RAD YIELD	APP K/Ca	APP K/Cl	F	AGE (Ma)	precision intra-sample	precision intra-package	precision inter-package
A	1650	100.0	98.4	1882.27	296	15.824	247.99 ▪	.33	1.21	1.67

Total gas K/Ca =

Precisions are 1 sigma, measured in Ma. Measured 40/36 atm = 296.5 ▪.5
J = 0.009312 ▪ 0.50% (intra-package) ▪ 0.50% (inter-package)
Trap current factors- 40: 2.26 100: 2.26 200: 1
Manifold factors- ALL: 1 SPLIT 1: 3.67 SPLIT 2: 10.89 SPLIT 3: 35.937
EALL: 2.1167 ESPLIT 1: 7.77 ESPLIT 2: 21.78
Sensitivity = 1.475E-17 % Reproducibility = .25 Detection limit = 40 counts
Data reduced assuming initial 40/36 = 295.50 ▪ 0.00
Ca-factors: 3637=2.6E-04▪1.7E-06 3837=3.2E-05▪2.4E-07 3937=6.7E-04▪3.7E-06
K-factors: 3739=0.0E+00▪2.2E-03 3839=1.3E-02▪2.4E-04 4039=5.7E-03▪4.0E-03

J = 0.009312 ▪ 0.50% SAMPLE WT = 0.0250 g

TEMP C	Initial & radiogenic 40Ar	Potassium derived 39Ar	Chlorine derived 38Ar	Calcium derived 37Ar	Initial 36Ar	AGE* in Ma	**
1650	9.363E-11	5.824E-12	4.768E-14	***	4.948E-15	247.99 ▪	.33

Note: all gas quantities are in moles. No blank correction.
* Ages calculated assuming initial 40Ar/36Ar = 295.5 ▪ 0
** 1-sigma precision estimates are for intra-sample reproducibility.
** 1-sigma precision estimates for plateaux are for intra-irradiation package reproducibility.
*** below detection limit

R A W D A T A

FILE	TEMP	40Ar	39Ar	38Ar	37Ar	36Ar regression	TRAP CURRENT	MANIFOLD OPTION
31114	1040	492488	28117	2543	115890	137	200	EALL
	±	549	42	37	900	10		
31115	1050	411679	24351	2158	100144	129	200	EALL
	±	364	7	17	60	10		
31116	1060	398562	23849	2084	102166	110	200	EALL
	±	813	49	9	1229	8		
31117	1080	2394779	142113	11933	560175	551	200	EALL
	±	2934	231	31	1047	10		
31118	1100	1004716	59720	4774	226300	204	200	EALL
	±	365	39	18	90	10		
31119	1125	352292	21067	1740	81463	95	200	EALL
	±	540	48	21	185	7		
31120	1150	685415	40765	3522	159154	180	200	EALL
	±	1245	78	30	294	7		
31121	1175	353571	21096	1746	81066	86	200	EALL
	±	837	42	19	65	7		

C O R R E C T I O N S

TEMP °C	39Ar Decay	37Ar Decay	-----K-derived---- 40Ar	38Ar	37Ar	----Ca-derived---- 39Ar	38Ar	36Ar	Cl-der 36Ar	Initial 38Ar
1040	10	204820	157	371	0	211	10	83	0	9
1050	8	177140	136	322	0	182	9	72	0	10
1060	8	180871	133	315	0	186	9	73	0	6
1080	49	992544	796	1877	0	1022	48	401	1	25
1100	21	401304	334	789	0	413	19	162	0	7
1125	7	144581	118	278	0	149	7	58	0	6
1150	14	282705	228	539	0	291	14	114	0	11
1175	7	144118	118	279	0	148	7	58	0	5

All values in counts, corrected for mass discrimination

TEMP C	% TOT 39Ar	RAD YIELD	APP K/Ca	APP K/Cl	F	AGE (Ma)	intra-sample	precision intra-package	precision inter-package
1040	7.8	97.0	.05	31	17.239	253.18 ±	1.38	1.82	2.17
1050	6.7	96.2	.05	32	16.489	242.88 ±	1.71	2.06	2.36
1060	6.6	97.5	.04	33	16.534	243.50 ±	1.38	1.79	2.13
1080	39.4	98.4	.05	34	16.809	247.28 ±	.40	1.23	1.69
1100	16.5	99.0	.05	37	16.879	248.24 ±	.65	1.33	1.77
1125	5.8	97.2	.05	35	16.481	242.77 ±	1.46	1.85	2.18
1150	11.3	97.4	.05	33	16.606	244.49 ±	.83	1.42	1.82
1175	5.8	97.9	.05	35	16.640	244.95 ±	1.51	1.90	2.22

otal gas K/Ca = 0.0

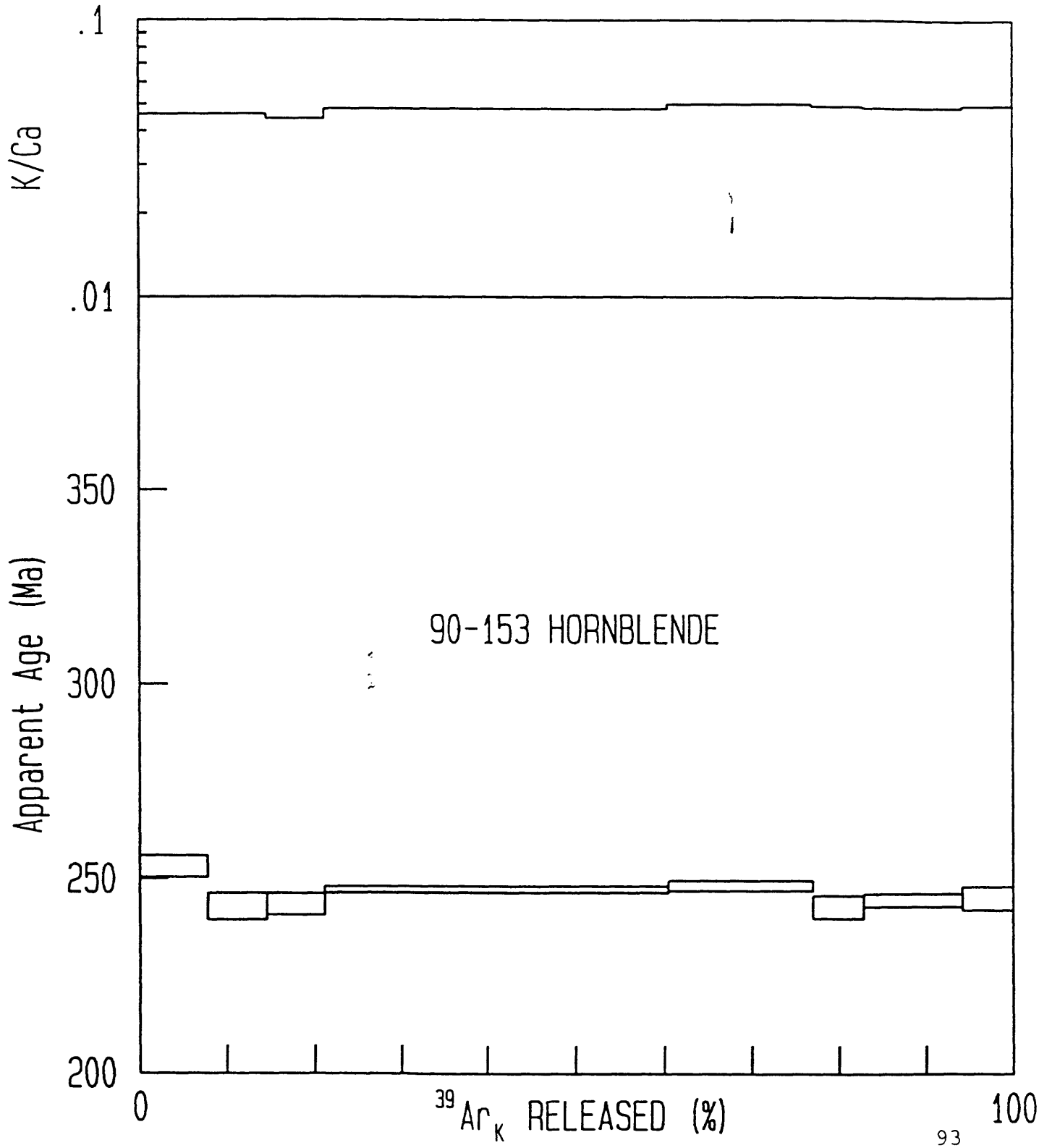
recisions are 1 sigma, measured in Ma. Measured 40/36 atm = 286.8 ±.5
= 0.008740 ± 0.50% (intra-package) ± 0.50% (inter-package)
rap current factors- 40: 5.66 100: 2.62 200: 1
anifold factors- ALL: 1 SPLIT 1: 3.3 SPLIT 2: 10.89 SPLIT 3: 35.937
EALL: 2 ESPLIT 1: 6.6 ESPLIT 2: 21.78
ensitivity = 1.000E-17 % Reproducibility = .25 Detection limit = 40 counts
ata reduced assuming initial 40/36 = 295.50 ± 0.00
a-factors: 3637=2.6E-04±1.7E-06 3837=3.2E-05±2.4E-07 3937=6.7E-04±3.7E-06
-factors: 3739=0.0E+00±2.2E-03 3839=1.3E-02±2.4E-04 4039=5.7E-03±4.0E-03

J = 0.008740 ± 0.50% SAMPLE WT = 0.1009 g

TEMP C	Initial & radiogenic 40Ar	Potassium derived 39Ar	Chlorine derived 38Ar	Calcium derived 37Ar	Initial 36Ar	AGE* in Ma	**
1040	9.847E-12	5.542E-13	4.267E-14	6.273E-12	9.926E-16	253.18 ±	1.38
1050	8.231E-12	4.800E-13	3.613E-14	5.423E-12	1.072E-15	242.88 ±	1.71
1060	7.969E-12	4.699E-13	3.472E-14	5.536E-12	***	243.50 ±	1.38
1080	4.788E-11	2.802E-12	1.971E-13	3.037E-11	2.651E-15	247.28 ±	.40
1100	2.009E-11	1.178E-12	7.803E-14	1.227E-11	***	248.24 ±	.65
1125	7.043E-12	4.154E-13	2.870E-14	4.421E-12	***	242.77 ±	1.46
1150	1.370E-11	8.038E-13	5.859E-14	8.642E-12	1.206E-15	244.49 ±	.83
1175	7.069E-12	4.160E-13	2.878E-14	4.404E-12	***	244.95 ±	1.51
TOTAL GAS	1.218E-10	7.119E-12	5.048E-13	7.734E-11	8.466E-15	246.64	

55.9% of gas on plateau, steps 1080 through 1100 PLATEAU AGE = 247.55 + 1.29

Note: all gas quantities are in moles. No blank correction.
* Ages calculated assuming initial 40Ar/36Ar = 295.5 ± 0
** 1-sigma precision estimates are for intra-sample reproducibility.
** 1-sigma precision estimates for plateaux are for intra-irradiation package reproducibility.
*** below detection limit



v 04/05/92

(40/36in = 295.5)

, 04/05/92 17:17:02 2 Jun 1992 90-153 HBL RD85 #116 MUL BK COR = K

oint A deleted;

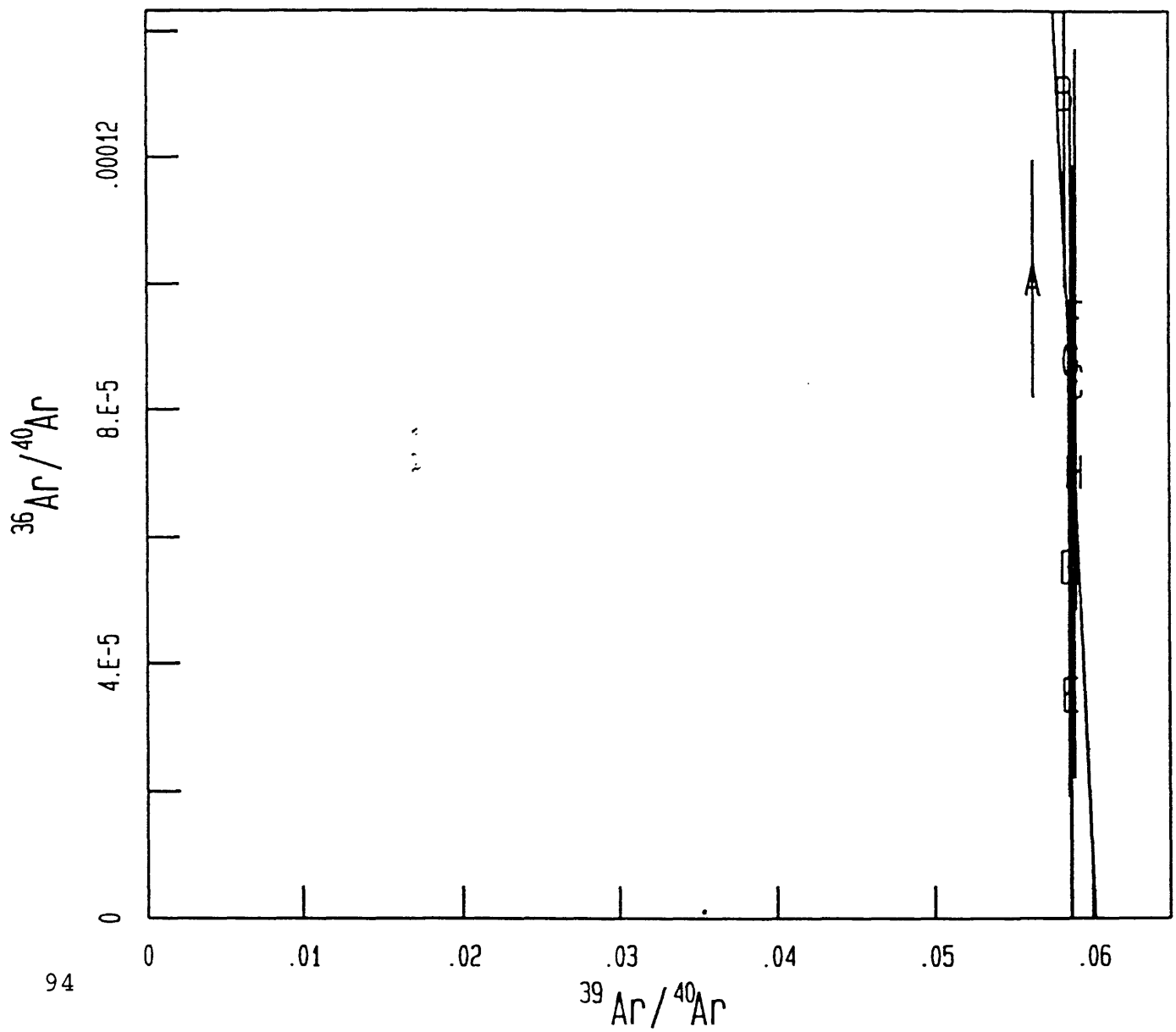
7 points regressed out of 8 includes 92.2 % of 39Ar

ean X = .587E-01 Mean Y = .833E-04 Slope = -.565E-01 + .602E-01

6/40 = .340E-02 + .353E-02 39/40 = .601E-01 + .168E-02

it parameters: SUMS = 4.07 MSWD = .814

0Ar/36Ar = 294.54 + 306.24 F = 16.63 + .465 AGE = 244.82 + 6.51 Ma



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W/O POINTS A

R A W D A T A

FILE	TEMP	40Ar	39Ar	38Ar	37Ar	36Ar ä regression	TRAP CURRENT	MANIFOLD OPTION
34803	1100	2502029	137783	17662	209866	952	200	ESPLIT
	▪	763	69	29	285	6		
34804	1135	1454169	82525	10572	140231	596	200	ESPLIT
	▪	459	27	40	221	5		
34805	1250	4559506	245798	31747	423999	2469	200	EALL
	▪	7902	331	33	903	12		
34806	1500	687387	18186	2434	31406	1377	200	EALL
	▪	230	16	8	52	8		

C O R R E C T I O N S

TEMP C	39Ar Decay	37Ar Decay	K-derived 40Ar	K-derived 38Ar	K-derived 37Ar	Ca-derived 39Ar	Ca-derived 38Ar	Ca-derived 36Ar	Cl-der 36Ar	Initial 38Ar
1100	88	1047903	779	1838	0	849	40	333	3	116
1135	52	700730	466	1100	0	567	27	223	2	70
1250	156	2120075	1388	3276	0	1717	81	673	5	336
1500	12	157134	103	242	0	127	6	50	0	249

All values in counts, corrected for mass discrimination

	TEMP C	% TOT 39Ar	RAD YIELD	APP K/Ca	APP K/Cl	F	AGE (Ma)	precision intra-sample	precision intra-package	precision inter-package
A	1100	45.2	92.7	.06	21	16.903	264.80 ▪	.21	1.26	1.76
B	1135	27.1	92.4	.05	21	16.365	256.94 ▪	.27	1.23	1.72
C	1250	25.8	88.3	.05	21	16.472	258.51 ▪	.52	1.32	1.79
D	1500	1.9	42.8	.05	18	16.253	255.31 ▪	1.89	2.32	2.61

Total gas K/Ca = .1

Precisions are 1 sigma, measured in Ma. Measured 40/36 atm = 296.5 ▪.5
J = 0.009354 ▪ 0.50% (intra-package) ▪ 0.50% (inter-package)
Trap current factors- 40: 5.66 100: 2.26 200: 1
Manifold factors- ALL: 1 SPLIT 1: 3.3 SPLIT 2: 10.89 SPLIT 3: 35.937
EALL: 2.1167 ESPLIT 1: 6.6 ESPLIT 2: 21.78
Sensitivity = 1.475E-17 % Reproducibility = .25 Detection limit = 40 counts
Data reduced assuming initial 40/36 = 295.50 ▪ 0.00
Ca-factors: 3637=2.6E-04▪1.7E-06 3837=3.2E-05▪2.4E-07 3937=6.7E-04▪3.7E-06
K-factors: 3739=0.0E+00▪2.2E-03 3839=1.3E-02▪2.4E-04 4039=5.7E-03▪4.0E-03

v 06/13/92 03:14:23 21 Jan 1993

92-110 #33 RD91

J = 0.009354 ▪ 0.50% SAMPLE WT = 0.2499 g

TEMP C	Initial & radiogenic 40Ar	Potassium derived 39Ar	Chlorine derived 38Ar	Calcium derived 37Ar	Initial 36Ar	AGE* in Ma	**
1100	2.435E-10	1.335E-11	1.551E-12	1.228E-10	6.037E-14	264.80 ▪	.21
1135	1.415E-10	7.991E-12	9.281E-13	8.208E-11	3.639E-14	256.94 ▪	.27
1250	1.423E-10	7.632E-12	8.986E-13	7.963E-11	5.617E-14	258.51 ▪	.52
1500	2.146E-11	5.647E-13	7.614E-14	5.901E-12	4.156E-14	255.31 ▪	1.89
TOTAL GAS	5.488E-10	2.954E-11	3.454E-12	2.904E-10	1.945E-13	260.87	

54.8% of gas on plateau, steps 1135 through 1500 PLATEAU AGE = 257.28 + 1.34

Note: all gas quantities are in moles. No blank correction.

* Ages calculated assuming initial 40Ar/36Ar = 295.5 ▪ 0

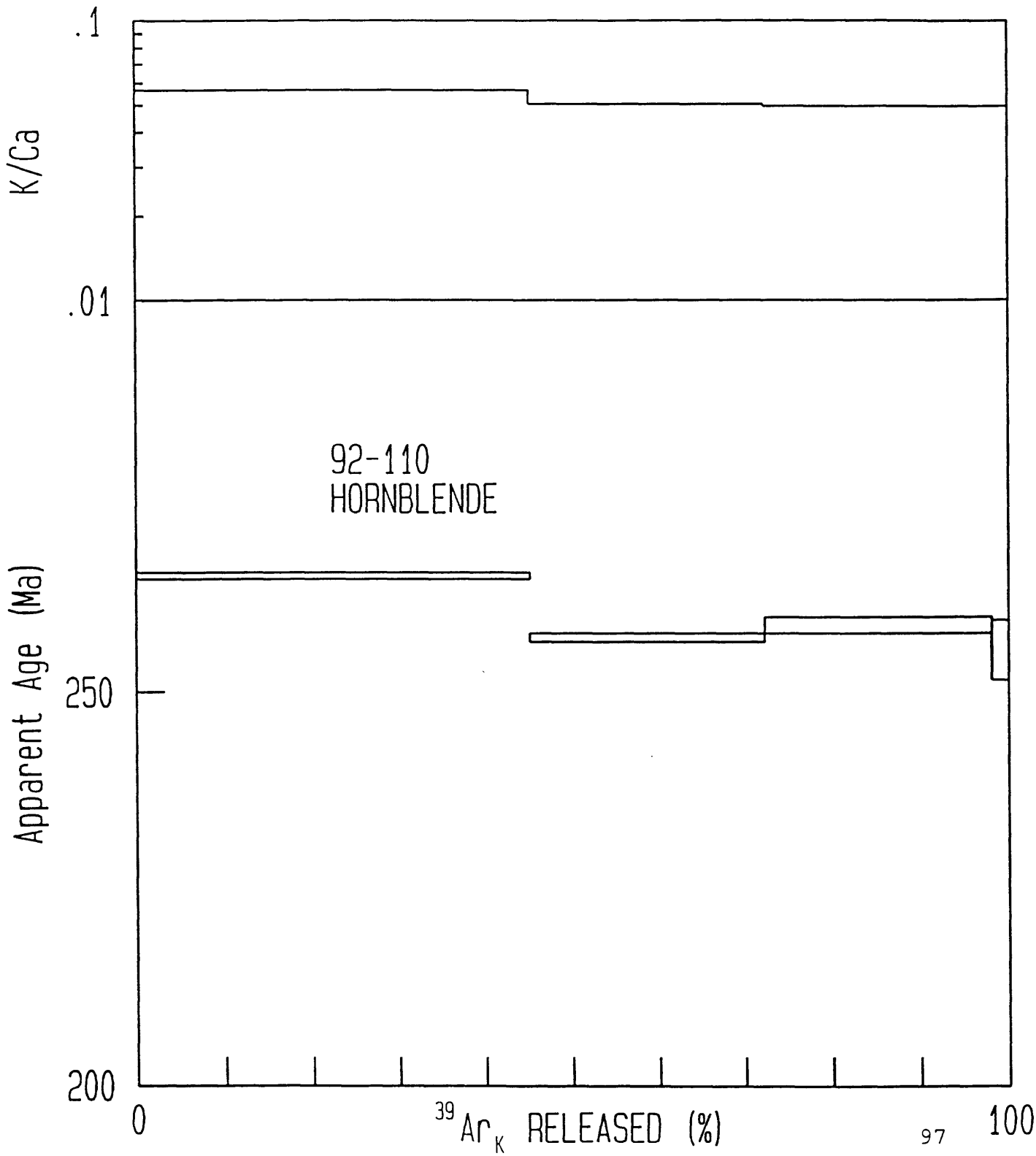
** 1-sigma precision estimates are for intra-sample reproducibility.

** 1-sigma precision estimates for plateaux are for intra-irradiation package reproducibility.

*** below detection limit

v 06/13/92

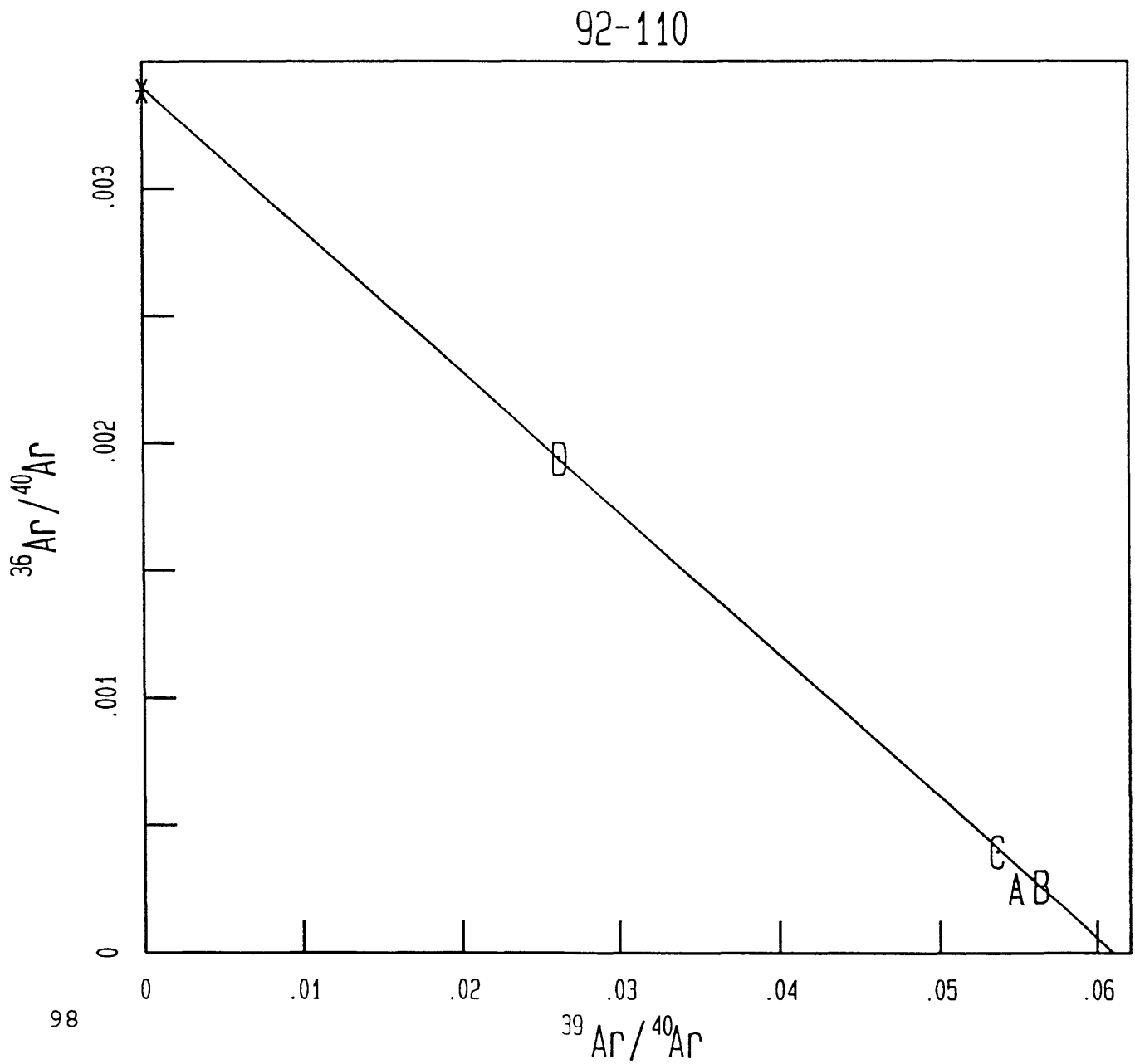
v 06/13/92 03:14:59 21 Jan 1993 92-110 #33 RD91



v 06/13/92 (40/36in = 295.5)

: 06/13/92 03:24:03 21 Jan 1993 92-110 #33 RD91

Point A deleted;
 3 points regressed out of 4 includes 54.8 % of 39Ar
Mean X = .537E-01 Mean Y = .408E-03 Slope = -.557E-01 ä+Ç .474E-03
36/40 = .340E-02 ä+Ç .257E-04 39/40 = .610E-01 ä+Ç .903E-04
Fit parameters: SUMS = 5.365 MSWD = 5.365
40Ar/36Ar = 294.24 ä+Ç 2.22 F = 16.394 ä+Ç .024 AGE = 257.37 ä+Ç 1.25 Ma



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W/O POINTS A

R A W D A T A

FILE	TEMP	40Ar	39Ar	38Ar	37Ar	36Ar	TRAP CURRENT	MANIFOLD OPTION
						ä regression		
34775	1100	753697	24805	1146	84046	1354	200	EALL
	▪	365	38	10	118	12		
34776	1125	942517	49553	1886	175212	845	200	EALL
	▪	469	35	11	47	7		
34777	1200	1931464	109331	4083	385895	1363	200	EALL
	▪	419	29	11	619	7		
34778	1350	643277	27025	1154	94240	884	200	EALL
	▪	224	20	11	141	6		

C O R R E C T I O N S

TEMP C	39Ar Decay	37Ar Decay	-----K-derived---- 40Ar	38Ar	37Ar	----Ca-derived---- 39Ar	38Ar	36Ar	Cl-der 36Ar	Initial 38Ar
1100	16	412325	139	328	0	335	16	131	0	229
1125	31	860040	278	656	0	698	33	274	0	107
1200	69	1895190	613	1447	0	1539	72	604	0	143
1350	17	463073	152	358	0	376	18	148	0	138

All values in counts, corrected for mass discrimination

	TEMP C	% TOT 39Ar	RAD YIELD	APP K/Ca	APP K/Cl	F	AGE (Ma)	precision intra-sample	precision intra-package	precision inter-package
A	1100	11.8	51.9	.03	57	15.952	253.74 ▪	2.17	2.51	2.78
B	1125	23.5	82.0	.02	91	15.794	251.40 ▪	.63	1.35	1.79
C	1200	51.9	88.3	.02	96	15.796	251.43 ▪	.31	1.23	1.71
D	1350	12.8	66.0	.02	70	15.913	253.18 ▪	1.04	1.60	2.00

Total gas K/Ca = 0.0

Precisions are 1 sigma, measured in Ma. Measured 40/36 atm = 296.5 ▪.5
J = 0.009468 ▪ 0.50% (intra-package) ▪ 0.50% (inter-package)
Trap current factors- 40: 5.66 100: 2.26 200: 1
Manifold factors- ALL: 1 SPLIT 1: 3.3 SPLIT 2: 10.89 SPLIT 3: 35.937
EALL: 2.1167 ESPLIT 1: 6.6 ESPLIT 2: 21.78
Sensitivity = 1.475E-17 % Reproducibility = .25 Detection limit = 40 counts
Data reduced assuming initial 40/36 = 295.50 ▪ 0.00
Ca-factors: 3637=2.6E-04▪1.7E-06 3837=3.2E-05▪2.4E-07 3937=6.7E-04▪3.7E-06
K-factors: 3739=0.0E+00▪2.2E-03 3839=1.3E-02▪2.4E-04 4039=5.7E-03▪4.0E-03

v 06/13/92 03:05:45 21 Jan 1993

92-122 #35 RD91

J = 0.009468 ▪ 0.50% SAMPLE WT = 0.1012 g

TEMP C	Initial & radiogenic 40Ar	Potassium derived 39Ar	Chlorine derived 38Ar	Calcium derived 37Ar	Initial 36Ar	AGE* in Ma	**
1100	2.353E-11	7.651E-13	3.227E-14	1.554E-11	3.831E-14	253.74 ▪	2.17
1125	2.942E-11	1.528E-12	4.084E-14	3.240E-11	1.791E-14	251.40 ▪	.63
1200	6.028E-11	3.370E-12	8.474E-14	7.140E-11	2.384E-14	251.43 ▪	.31
1350	2.008E-11	8.333E-13	2.868E-14	1.744E-11	2.308E-14	253.18 ▪	1.04
TOTAL GAS	1.333E-10	6.496E-12	1.865E-13	1.368E-10	1.031E-13	251.92	

100.0% of gas on plateau, steps 1100 through 1350 PLATEAU AGE = 251.60 + 1.31

Note: all gas quantities are in moles. No blank correction.

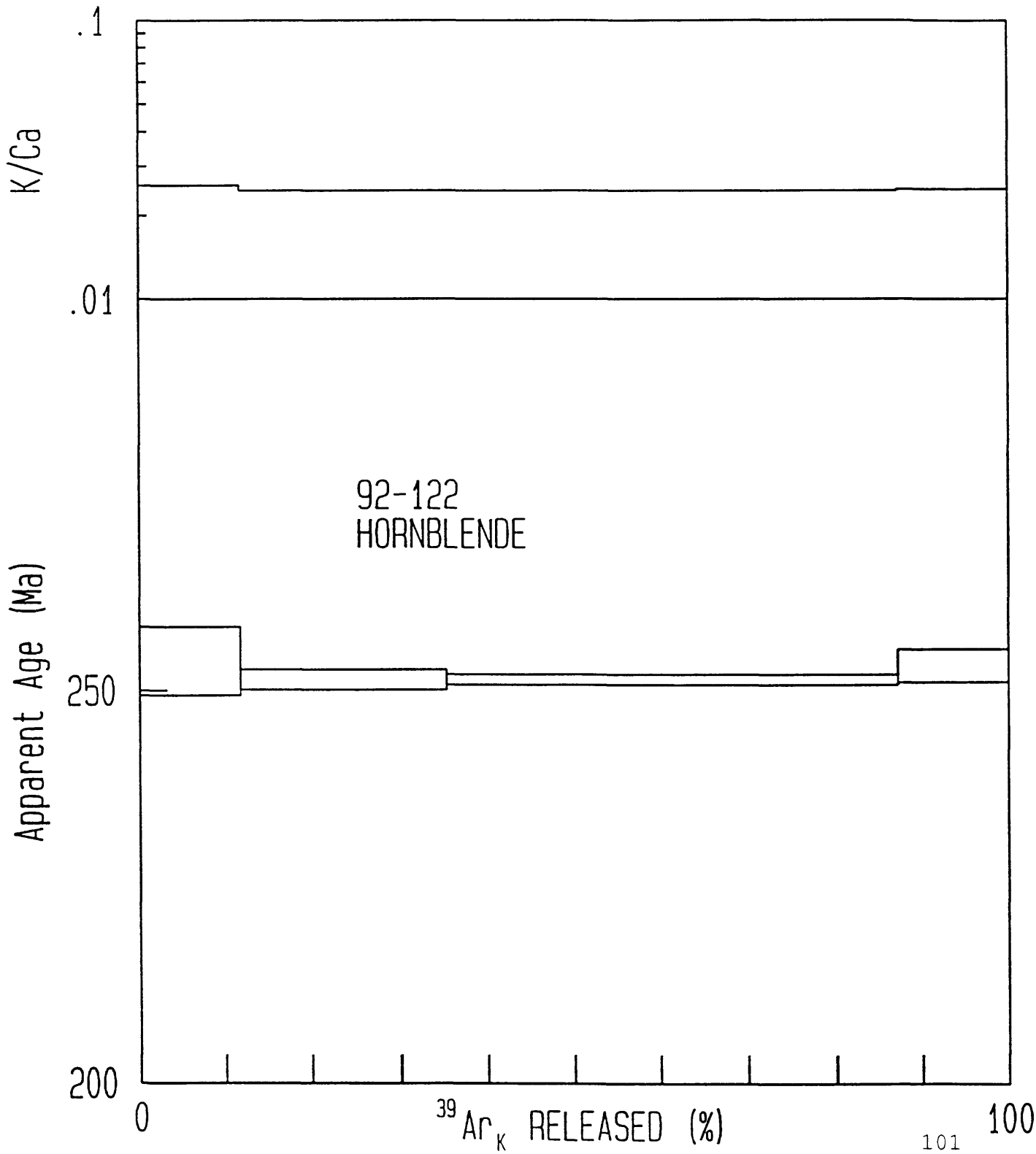
* Ages calculated assuming initial 40Ar/36Ar = 295.5 ▪ 0

** 1-sigma precision estimates are for intra-sample reproducibility.

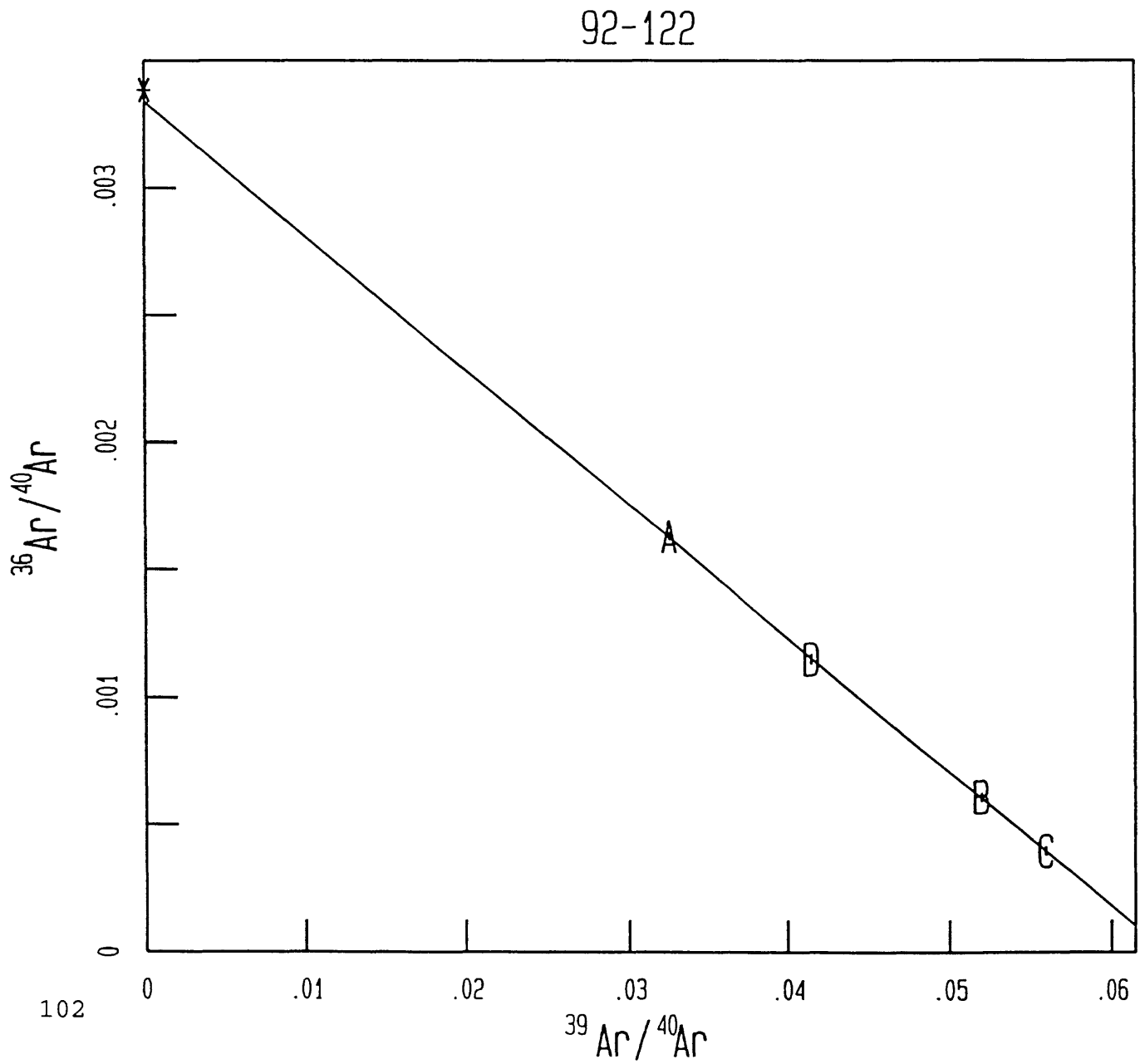
** 1-sigma precision estimates for plateaux are for intra-irradiation package reproducibility.

*** below detection limit

v 06/13/92


.1
K/Ca
.01
92-122
HORNBLENDE
Apparent Age (Ma)
250
200
0
$^{39}Ar_K$ RELEASED (%)
100
101

v 06/13/92 03:09:53 21 Jan 1993 92-122 #35 RD91
Point deleted;
4 points regressed out of 4
Mean X = .449E-01 Mean Y = .975E-03 Slope = -.526E-01 ä+Ç .933E-03
36/40 = .334E-02 ä+Ç .429E-04 39/40 = .634E-01 ä+Ç .370E-03
Fit parameters: SUMS = .103 MSWD = .051
40Ar/36Ar = 299.57 ä+Ç 3.85 F = 15.762 ä+Ç .092 AGE = 250.94 ä+Ç 1.8 Ma



R A W D A T A

FILE	TEMP	40Ar	39Ar	38Ar	37Ar	36Ar ä regression	TRAP CURRENT	MANIFOLD OPTION
32597	1075	225544	12294	978	19173	25	200	EALL
	▪	70	11	16	23	4		
32598	1100	456751	25993	2242	41864	67	200	EALL
	▪	712	32	13	37	1		
32599	1125	1317485	76199	6501	124968	139	200	EALL
	▪	928	59	14	178	9		
32600	1150	2083850	121299	10345	199435	187	200	EALL
	▪	1281	83	15	338	6		
32601	1175	3246397	189444	16093	312322	248	200	EALL
	▪	2961	427	32	310	9		
32602	1200	1730753	101282	8491	164905	115	200	ESPLIT
	▪	578	39	5	326	8		
32603	1250	1465293	85919	7135	138991	99	200	ESPLIT
	▪	755	79	18	133	5		
32604	1450	2255485	131296	10976	216283	181	200	EALL
	▪	1440	139	13	220	7		

C O R R E C T I O N S

TEMP	39Ar	37Ar	-----K-derived----			----Ca-derived----			Cl-der	Initial
C	Decay	Decay	40Ar	38Ar	37Ar	39Ar	38Ar	36Ar	36Ar	38Ar
1075	3	17769	70	165	0	25	1	10	0	3
1100	6	38835	147	348	0	54	3	21	0	9
1125	17	116049	432	1020	0	163	8	64	0	14
1150	28	185396	688	1624	0	260	12	102	1	16
1175	43	290617	1075	2536	0	407	19	160	1	17
1200	23	153624	575	1356	0	215	10	84	0	6
1250	20	129634	488	1150	0	181	9	71	0	5
1450	30	201917	745	1757	0	282	13	111	1	13

All values in counts, corrected for mass discrimination

	TEMP C	% TOT 39Ar	RAD YIELD	APP K/Ca	APP K/Cl	F	AGE (Ma)	intra-sample	precision intra-package	precision inter-package
A	1075	1.0	98.0	.17	36	17.995	271.54 ▪	1.37	1.87	2.25
B	1100	2.2	97.0	.17	33	17.064	258.45 ▪	.43	1.28	1.76
C	1125	6.5	98.3	.16	34	17.010	257.69 ▪	.54	1.32	1.79
D	1150	10.3	98.8	.16	34	16.984	257.33 ▪	.25	1.23	1.72
E	1175	16.1	99.2	.16	34	17.011	257.71 ▪	.30	1.24	1.73
F	1200	28.5	99.5	.16	34	17.010	257.69 ▪	.36	1.26	1.74
G	1250	24.1	99.4	.17	35	16.969	257.12 ▪	.29	1.24	1.72
H	1450	11.2	99.1	.16	34	17.032	258.00 ▪	.27	1.24	1.73

Total gas K/Ca = .2

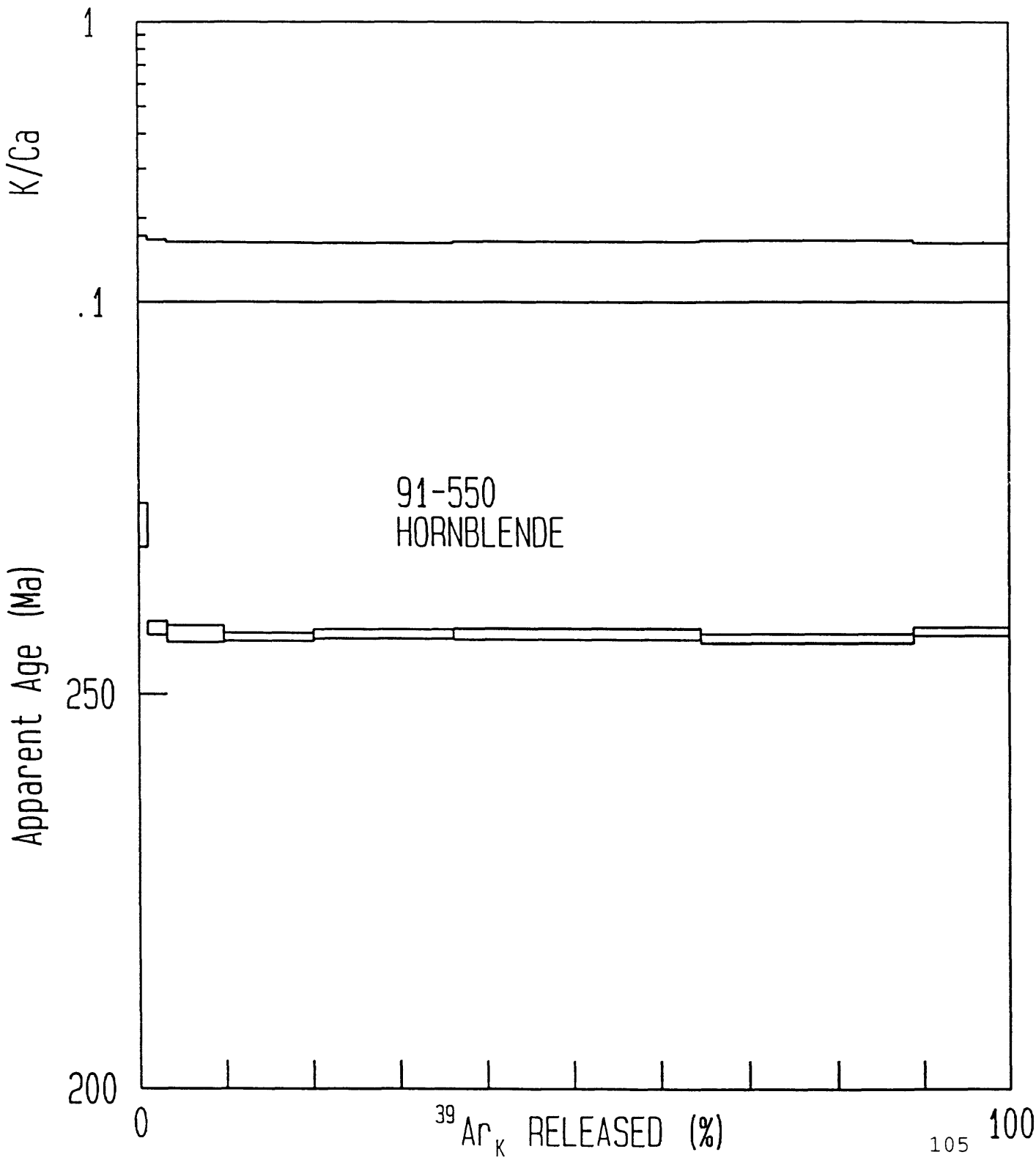
Precisions are 1 sigma, measured in Ma. Measured 40/36 atm = 296.5 ▪.5
J = 0.009027 ▪ 0.50% (intra-package) ▪ 0.50% (inter-package)
Trap current factors- 40: 5.66 100: 2.26 200: 1
Manifold factors- ALL: 1 SPLIT 1: 3.51 SPLIT 2: 10.89 SPLIT 3: 35.937
EALL: 2 ESPLIT 1: 6.6 ESPLIT 2: 21.78
Sensitivity = 1.344E-17 % Reproducibility = .25 Detection limit = 40 counts
Data reduced assuming initial 40/36 = 295.50 ▪ 0.00
Ca-factors: 3637=2.6E-04▪1.7E-06 3837=3.2E-05▪2.4E-07 3937=6.7E-04▪3.7E-06
K-factors: 3739=0.0E+00▪2.2E-03 3839=1.3E-02▪2.4E-04 4039=5.7E-03▪4.0E-03

J = 0.009027 ▪ 0.50% SAMPLE WT = 1.0085 g

TEMP C	Initial & radiogenic 40Ar	Potassium derived 39Ar	Chlorine derived 38Ar	Calcium derived 37Ar	Initial 36Ar	AGE* in Ma	**
1075	6.061E-12	3.301E-13	2.196E-14	9.955E-13	***	271.54 ▪	1.37
1100	1.227E-11	6.980E-13	5.117E-14	2.175E-12	1.229E-15	258.45 ▪	.43
1125	3.540E-11	2.046E-12	1.478E-13	6.495E-12	2.027E-15	257.69 ▪	.54
1150	5.600E-11	3.257E-12	2.350E-13	1.037E-11	2.291E-15	257.33 ▪	.25
1175	8.723E-11	5.087E-12	3.651E-13	1.625E-11	2.374E-15	257.71 ▪	.30
1200	1.535E-10	8.975E-12	6.338E-13	2.833E-11	***	257.69 ▪	.36
1250	1.299E-10	7.613E-12	5.316E-13	2.389E-11	***	257.12 ▪	.29
1450	6.061E-11	3.525E-12	2.483E-13	1.127E-11	1.904E-15	258.00 ▪	.27
TOTAL GAS	5.410E-10	3.153E-11	2.235E-12	9.977E-11	1.547E-14	257.71	

99.0% of gas on plateau, steps 1100 through 1450 PLATEAU AGE = 257.64 + 1.34

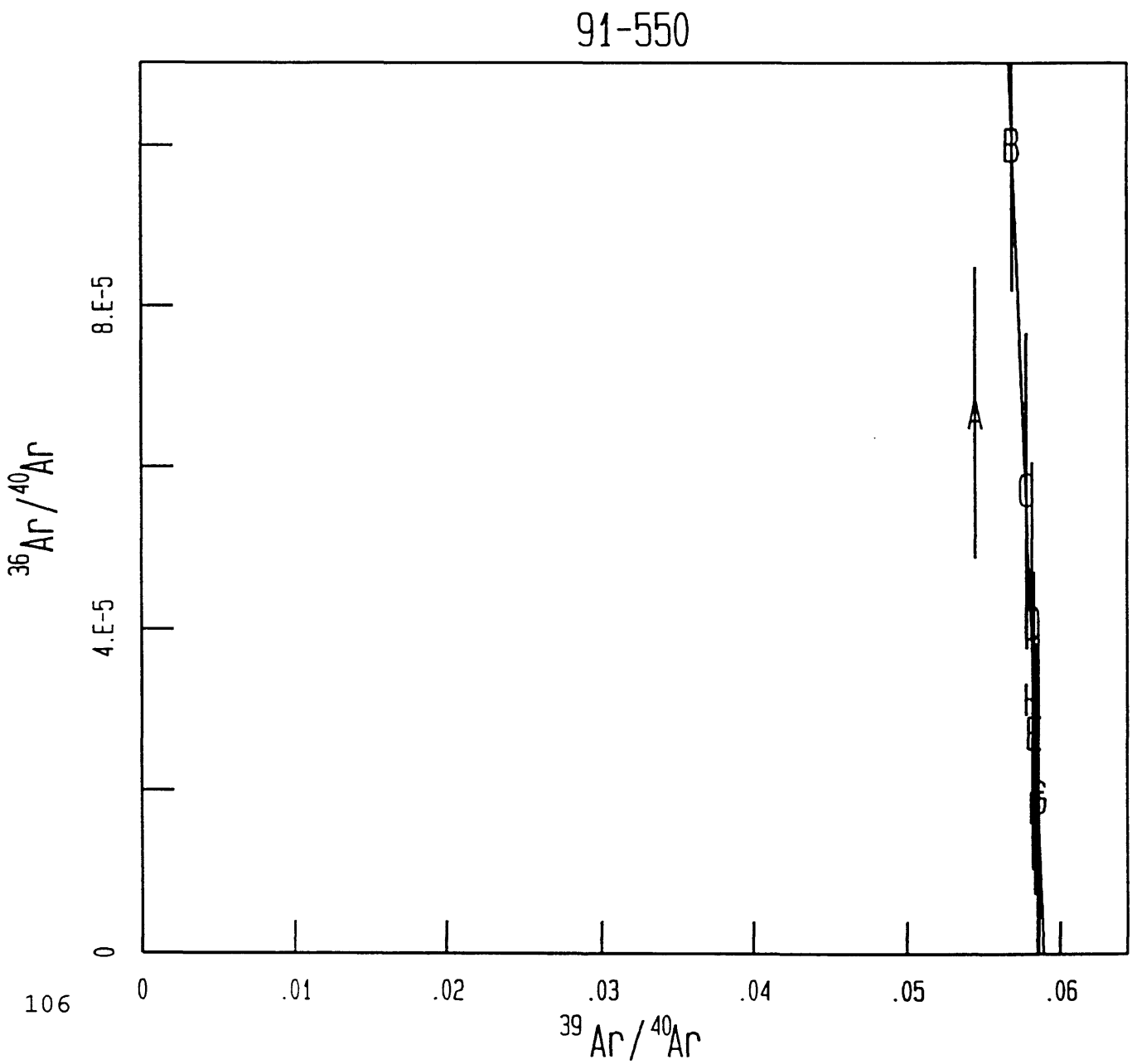
Note: all gas quantities are in moles. No blank correction.
* Ages calculated assuming initial 40Ar/36Ar = 295.5 ▪ 0
** 1-sigma precision estimates are for intra-sample reproducibility.
** 1-sigma precision estimates for plateaux are for intra-irradiation package reproducibility.
*** below detection limit



v 06/13/92 (40/36in = 295.5)

v 06/13/92 03:26:03 23 Jan 1993 91-550 #6,7,8 RD87

Point A deleted;
 7 points regressed out of 8 includes 99 % of 39Ar
Mean X = .580E-01 Mean Y = .446E-04 Slope = -.494E-01 ä+Ç .137E-01
36/40 = .291E-02 ä+Ç .795E-03 39/40 = .589E-01 ä+Ç .296E-03
Fit parameters: SUMS = .177 MSWD = .035
40Ar/36Ar = 343.5 ä+Ç 93.8 F = 16.976 ä+Ç .085 AGE = 257.21 ä+Ç 1.7 Ma



W/O POINTS A

R A W D A T A

FILE	TEMP	40Ar	39Ar	38Ar	37Ar	36Ar	TRAP	MANIFOLD
						ä regression	CURRENT	OPTION
34850	450	2345683	138031	3394	367	45	40	EALL
	▪	519	125	13	18	8		

C O R R E C T I O N S

TEMP	39Ar	37Ar	-----K-derived----			----Ca-derived----			Cl-der	Initial
C	Decay	Decay	40Ar	38Ar	37Ar	39Ar	38Ar	36Ar	36Ar	38Ar
450	185	13644	786	1854	0	9	0	4	1	8

All values in counts, corrected for mass discrimination

	TEMP C	% TOT 39Ar	RAD YIELD	APP K/Ca	APP K/Cl	F	AGE (Ma)	intra-sample	precision intra-package	precision inter-package
A	450	100.0	99.5	5.12	215	16.866	256.00 ▪	.24	1.22	1.71

Total gas K/Ca = 5.1

Precisions are 1 sigma, measured in Ma. Measured 40/36 atm = 296.5 ▪.5
J = 0.009040 ▪ 0.50% (intra-package) ▪ 0.50% (inter-package)
Trap current factors- 40: 2.26 100: 2.26 200: 1
Manifold factors- ALL: 1 SPLIT 1: 3.3 SPLIT 2: 10.89 SPLIT 3: 35.937
EALL: 2.1167 ESPLIT 1: 7.77 ESPLIT 2: 21.78
Sensitivity = 1.475E-17 % Reproducibility = .25 Detection limit = 40 counts
Data reduced assuming initial 40/36 = 295.50 ▪ 0.00
Ca-factors: 3637=2.6E-04▪1.7E-06 3837=3.2E-05▪2.4E-07 3937=6.7E-04▪3.7E-06
K-factors: 3739=0.0E+00▪2.2E-03 3839=1.3E-02▪2.4E-04 4039=5.7E-03▪4.0E-03

J = 0.009040 ▪ 0.50% SAMPLE WT = 0.0510 g

TEMP C	Initial & radiogenic 40Ar	Potassium derived 39Ar	Chlorine derived 38Ar	Calcium derived 37Ar	Initial 36Ar	AGE* in Ma	**
450	1.655E-10	9.760E-12	1.096E-13	9.911E-13	2.858E-15	256.00 ▪	.24

Note: all gas quantities are in moles. No blank correction.
* Ages calculated assuming initial 40Ar/36Ar = 295.5 ▪ 0
** 1-sigma precision estimates are for intra-sample reproducibility.
** 1-sigma precision estimates for plateaux are for intra-irradiation package reproducibility.
*** below detection limit

R A W D A T A

FILE	TEMP	40Ar	39Ar	38Ar	37Ar	36Ar ä regression	TRAP CURRENT	MANIFOLD OPTION
34670	1100	1269785	59748	2037	141807	694	200	EALL
	▪	888	57	13	156	5		
34671	1125	2853958	158219	4580	338777	1010	200	EALL
	▪	2006	140	11	423	4		
34672	1150	530058	25299	763	49688	403	200	EALL
	▪	143	16	15	34	5		
34673	1175	248977	9521	306	21147	307	200	EALL
	▪	90	9	11	38	16		
34674	1200	489174	23181	780	51592	370	200	EALL
	▪	212	15	6	73	6		
34675	1250	1091810	56053	1809	123604	544	200	EALL
	▪	499	29	13	157	7		

C O R R E C T I O N S

TEMP C	39Ar Decay	37Ar Decay	-----K-derived---- 40Ar	38Ar	37Ar	----Ca-derived---- 39Ar	38Ar	36Ar	Cl-der 36Ar	Initial 38Ar
1100	36	625984	337	795	0	518	24	203	0	92
1125	95	1496280	893	2107	0	1238	58	486	0	99
1150	15	219577	143	337	0	182	9	71	0	62
1175	6	93499	54	127	0	77	4	30	0	52
1200	14	228236	131	309	0	189	9	74	0	56
1250	34	547101	316	746	0	453	21	178	0	69

All values in counts, corrected for mass discrimination

TEMP C	% TOT 39Ar	RAD YIELD	APP K/Ca	APP K/Cl	F	AGE (Ma)	precision intra-sample	precision intra-package	precision inter-package
A 1100	18.0	88.5	.04	109	18.945	288.00 ▪	.43	1.41	1.94
B 1125	47.7	94.5	.04	151	17.157	262.70 ▪	.21	1.25	1.75
C 1150	7.6	81.4	.05	127	17.152	262.63 ▪	.78	1.46	1.91
D 1175	2.9	67.0	.04	100	17.630	269.43 ▪	7.31	7.42	7.53
E 1200	7.0	82.1	.04	107	17.426	266.54 ▪	1.09	1.66	2.08
F 1250	16.9	90.0	.04	121	17.647	269.68 ▪	.52	1.37	1.86

Total gas K/Ca = 0.0

Precisions are 1 sigma, measured in Ma. Measured 40/36 atm = 296.5 ▪.5
J = 0.009137 ▪ 0.50% (intra-package) ▪ 0.50% (inter-package)
Trap current factors- 40: 5.66 100: 2.26 200: 1
Manifold factors- ALL: 1 SPLIT 1: 3.3 SPLIT 2: 10.89 SPLIT 3: 35.937
EALL: 2.1167 ESPLIT 1: 6.6 ESPLIT 2: 21.78
Sensitivity = 1.475E-17 % Reproducibility = .25 Detection limit = 40 counts
Data reduced assuming initial 40/36 = 295.50 ▪ 0.00
Ca-factors: 3637=2.6E-04▪1.7E-06 3837=3.2E-05▪2.4E-07 3937=6.7E-04▪3.7E-06
K-factors: 3739=0.0E+00▪2.2E-03 3839=1.3E-02▪2.4E-04 4039=5.7E-03▪4.0E-03

v 06/13/92 01:00:29 21 Jan 1993

92-107 #21,22,23,24 RD91

J = 0.009137 ▪ 0.50% SAMPLE WT = 1.0002 g

TEMP C	Initial & radiogenic 40Ar	Potassium derived 39Ar	Chlorine derived 38Ar	Calcium derived 37Ar	Initial 36Ar	AGE* in Ma	**
1100	3.963E-11	1.852E-12	4.100E-14	2.403E-11	1.540E-14	288.00 ▪	.43
1125	8.908E-11	4.908E-12	7.871E-14	5.744E-11	1.647E-14	262.70 ▪	.21
1150	1.654E-11	7.854E-13	1.502E-14	8.428E-12	1.041E-14	262.63 ▪	.78
1175	7.772E-12	2.953E-13	7.121E-15	3.588E-12	8.684E-15	269.43 ▪	7.31
1200	1.527E-11	7.189E-13	1.621E-14	8.759E-12	9.275E-15	266.54 ▪	1.09
1250	3.408E-11	1.738E-12	3.477E-14	2.099E-11	1.150E-14	269.68 ▪	.52
TOTAL GAS	2.024E-10	1.030E-11	1.928E-13	1.232E-10	7.173E-14	268.91	

58.2% of gas on plateau, steps 1125 through 1175 PLATEAU AGE = 262.70 + 1.37

Note: all gas quantities are in moles. No blank correction.

* Ages calculated assuming initial 40Ar/36Ar = 295.5 ▪ 0

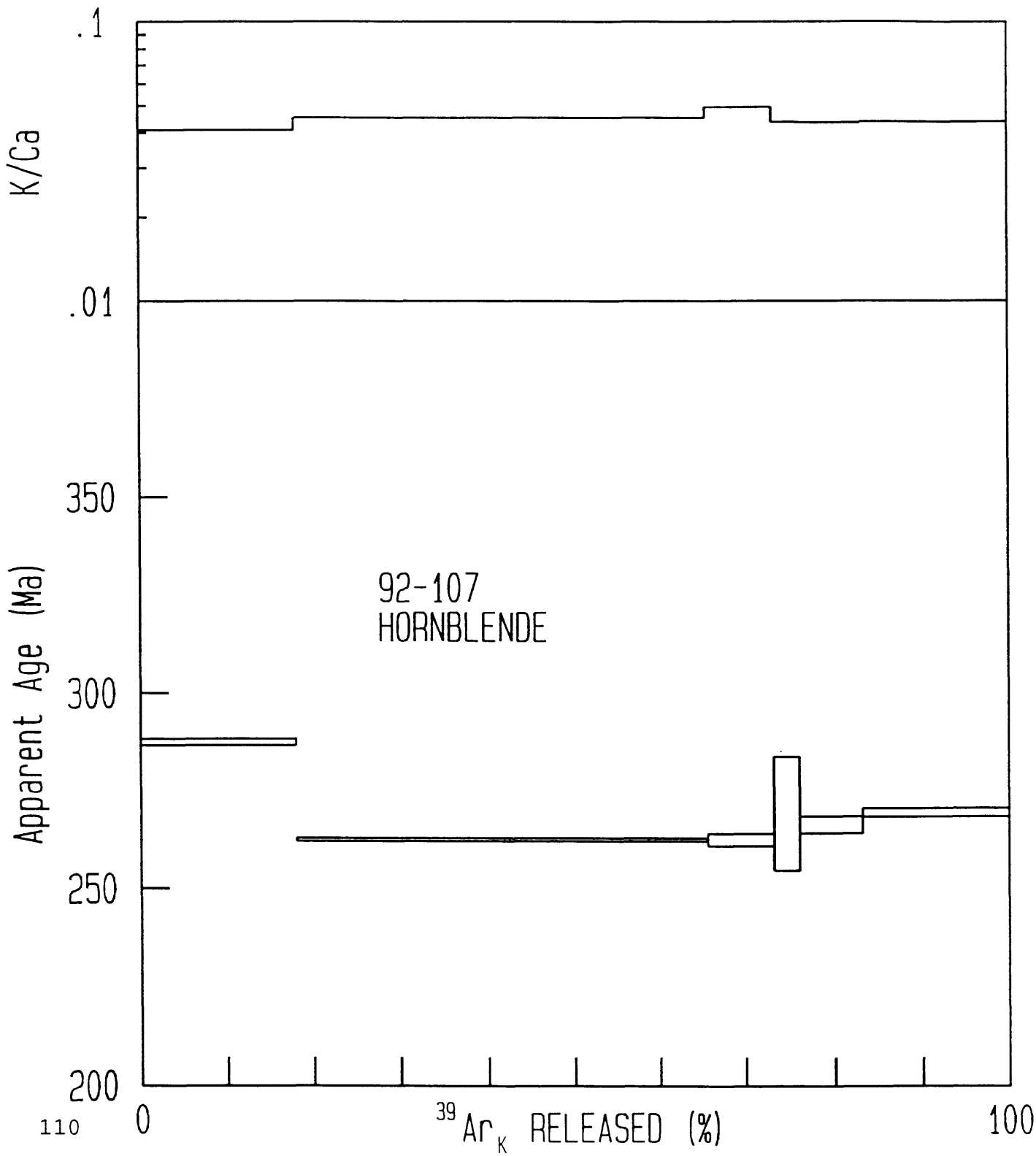
** 1-sigma precision estimates are for intra-sample reproducibility.

** 1-sigma precision estimates for plateaux are for intra-irradiation package reproducibility.

*** below detection limit

v 06/13/92

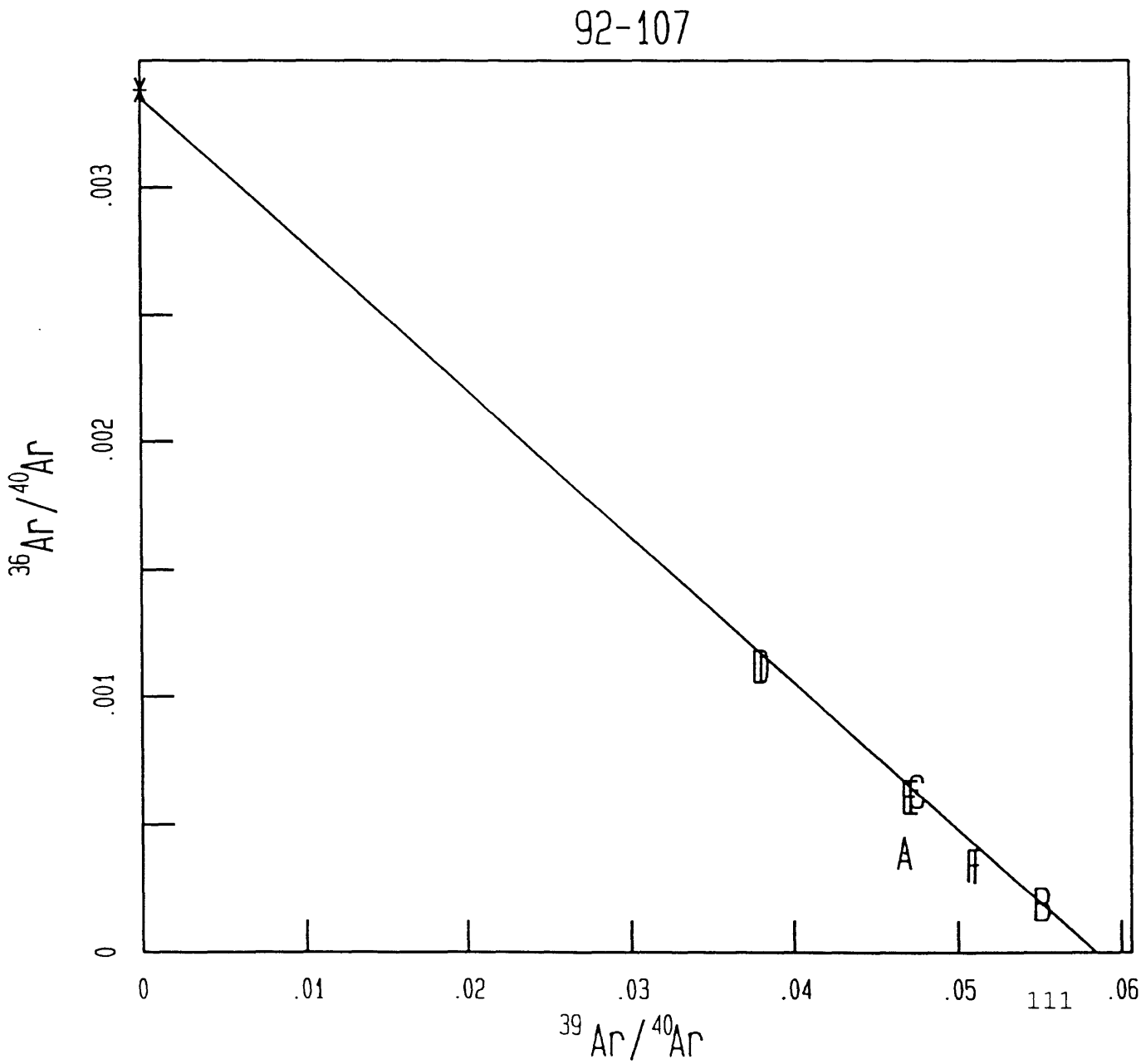
v 06/13/92 05:17:31 23 Jan 1993 92-107 #21,22,23,24 RD91



v 06/13/92 (40/36in = 295.5)

v 06/13/92 05:23:19 23 Jan 1993 92-107 #21,22,23,24 RD91

Point A deleted;
5 points regressed out of 6 includes 82 % of 39Ar
Mean X = .533E-01 Mean Y = .290E-03 Slope = -.574E-01 ä+Ç .142E-02
36/40 = .335E-02 ä+Ç .761E-04 39/40 = .584E-01 ä+Ç .150E-03
Fit parameters: SUMS = 2.569 MSWD = .856
40Ar/36Ar = 298.22 ä+Ç 6.77 F = 17.126 ä+Ç .044 AGE = 262.26 ä+Ç 1.37 Ma



W/O POINTS A

R A W D A T A

FILE	TEMP	40Ar	39Ar	38Ar	37Ar	36Ar ä regression	TRAP CURRENT	MANIFOLD OPTION
30920	1050	1119429	61086	2144	196597	409	200	EALL
	▪	792	64	9	217	2		
30921	1075	1617679	94597	4008	295767	304	200	ESPLIT
	▪	1613	154	6	230	5		
30922	1100	1622928	95130	4795	290219	293	200	EALL
	▪	396	21	6	93	3		
30923	1125	554490	32525	1633	98536	117	200	EALL
	▪	465	24	10	76	4		
30924	1150	412064	23513	821	77989	133	200	EALL
	▪	190	13	10	67	8		
30925	1175	291236	16587	568	54736	94	200	EALL
	▪	182	10	8	49	3		
30926	1200	325499	18429	695	59155	99	200	EALL
	▪	25	9	6	47	10		
30927	1250	413103	23815	878	76232	96	200	EALL
	▪	114	18	12	68	6		

C O R R E C T I O N S

TEMP |C	39Ar Decay	37Ar Decay	-----K-derived---- 40Ar	38Ar	37Ar	----Ca-derived---- 39Ar	38Ar	36Ar	Cl-der 36Ar	Initial 38Ar
1050	18	283648	346	815	0	324	15	127	0	53
1075	28	427186	535	1263	0	488	23	191	0	21
1100	28	419552	538	1270	0	479	23	188	0	20
1125	10	142577	184	434	0	163	8	64	0	10
1150	7	112948	133	314	0	129	6	51	0	16
1175	5	79346	94	221	0	90	4	35	0	11
1200	6	85829	104	246	0	98	5	38	0	11
1250	7	110706	135	318	0	126	6	49	0	9

All values in counts, corrected for mass discrimination

TEMP C	% TOT 39Ar	RAD YIELD	APP K/Ca	APP K/Cl	F	AGE (Ma)	precision intra-sample	precision intra-package	precision inter-package
A 1050	10.5	92.5	.07	107	17.021	252.79 ▪	.25	1.21	1.69
B 1075	53.5	97.9	.07	83	16.807	249.82 ▪	.31	1.21	1.68
C 1100	16.3	98.1	.07	65	16.790	249.57 ▪	.16	1.18	1.66
D 1125	5.6	97.2	.07	65	16.625	247.28 ▪	.57	1.29	1.73
E 1150	4.0	94.0	.06	109	16.549	246.22 ▪	1.42	1.83	2.16
F 1175	2.8	94.0	.06	113	16.569	246.50 ▪	.81	1.42	1.83
G 1200	3.2	94.5	.07	97	16.753	249.06 ▪	2.28	2.57	2.82
H 1250	4.1	96.7	.07	102	16.835	250.20 ▪	.96	1.52	1.92
Total gas K/Ca =			.1						

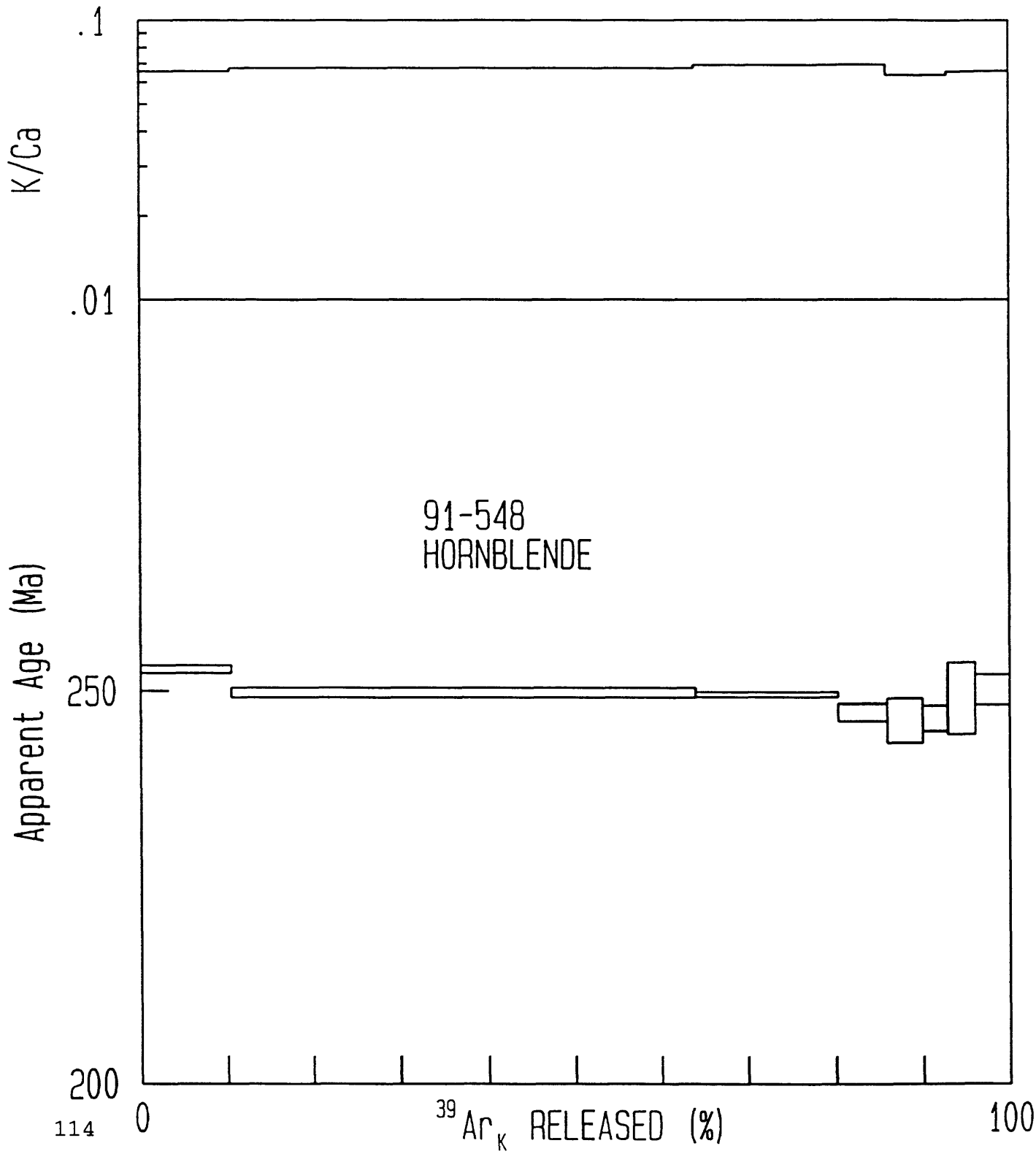
Precisions are 1 sigma, measured in Ma. Measured 40/36 atm = 296.5 ▪.5
J = 0.008837 ▪ 0.50% (intra-package) ▪ 0.50% (inter-package)
Trap current factors- 40: 5.66 100: 2.26 200: 1
Manifold factors- ALL: 1 SPLIT 1: 4.2 SPLIT 2: 10.89 SPLIT 3: 35.937
EALL: 2 ESPLIT 1: 6.6 ESPLIT 2: 21.78
Sensitivity = 1.344E-17 % Reproducibility = .25 Detection limit = 40 counts
Data reduced assuming initial 40/36 = 295.50 ▪ 0.00
Ca-factors: 3637=2.6E-04▪1.7E-06 3837=3.2E-05▪2.4E-07 3937=6.7E-04▪3.7E-06
K-factors: 3739=0.0E+00▪2.2E-03 3839=1.3E-02▪2.4E-04 4039=5.7E-03▪4.0E-03

J = 0.008837 ▪ 0.50% SAMPLE WT = 0.9990 g

TEMP C	Initial & radiogenic 40Ar	Potassium derived 39Ar	Chlorine derived 38Ar	Calcium derived 37Ar	Initial 36Ar	AGE* in Ma	**
1050	3.008E-11	1.635E-12	3.683E-14	1.294E-11	7.608E-15	252.79 ▪	.25
1075	1.434E-10	8.357E-12	2.440E-13	6.429E-11	1.008E-14	249.82 ▪	.31
1100	4.361E-11	2.547E-12	9.491E-14	1.913E-11	2.856E-15	249.57 ▪	.16
1125	1.490E-11	8.709E-13	3.237E-14	6.498E-12	1.425E-15	247.28 ▪	.57
1150	1.107E-11	6.293E-13	1.392E-14	5.145E-12	2.230E-15	246.22 ▪	1.42
1175	7.826E-12	4.440E-13	9.523E-15	3.613E-12	1.591E-15	246.50 ▪	.81
1200	8.747E-12	4.933E-13	1.229E-14	3.907E-12	1.632E-15	249.06 ▪	2.28
1250	1.110E-11	6.375E-13	1.518E-14	5.038E-12	1.247E-15	250.20 ▪	.96
TOTAL GAS	2.708E-10	1.561E-11	4.590E-13	1.206E-10	2.867E-14	249.70	

69.8% of gas on plateau, steps 1075 through 1100 PLATEAU AGE = 249.64 + 1.30

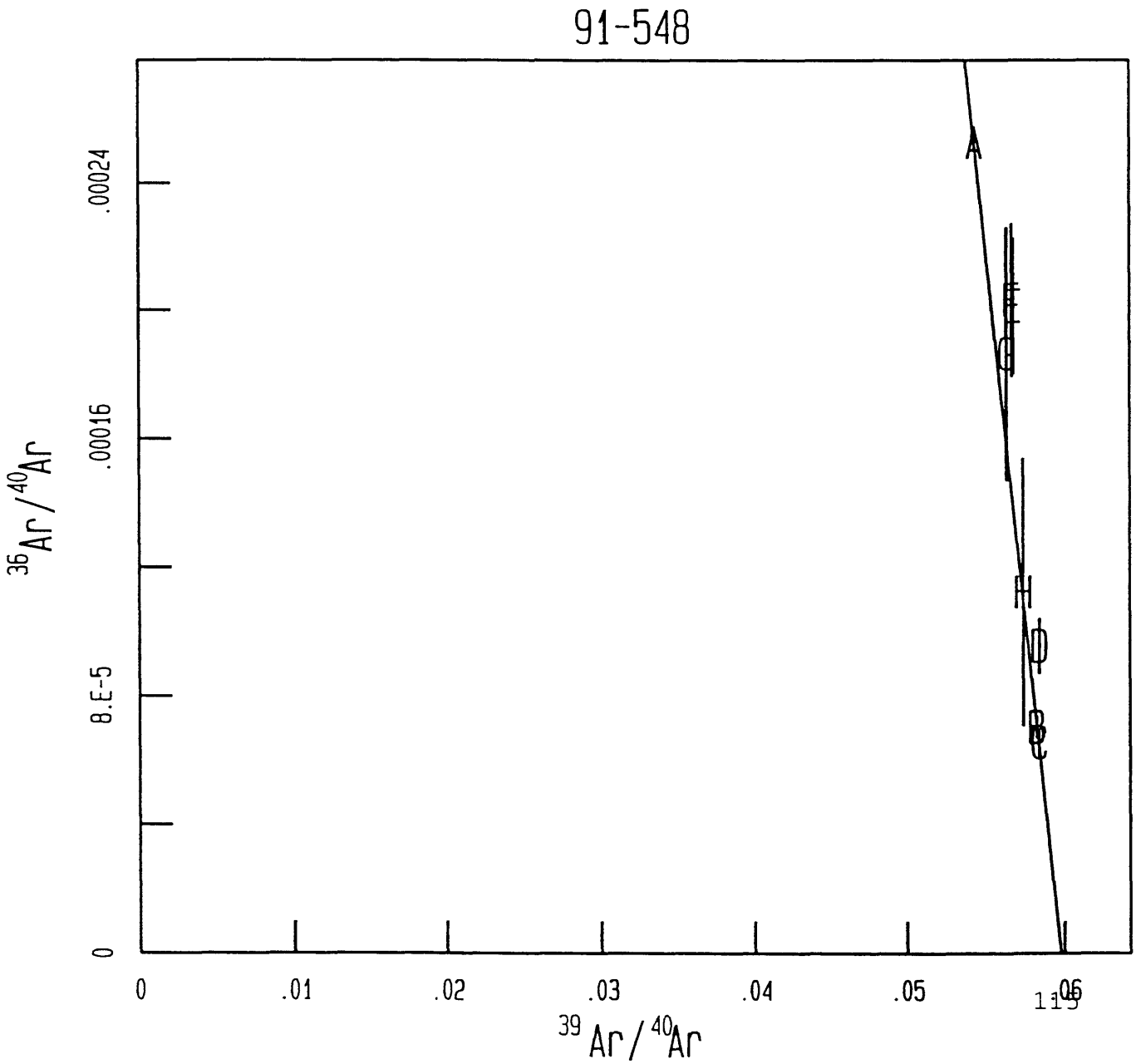
Note: all gas quantities are in moles. No blank correction.
* Ages calculated assuming initial 40Ar/36Ar = 295.5 ▪ 0
** 1-sigma precision estimates are for intra-sample reproducibility.
** 1-sigma precision estimates for plateaux are for intra-irradiation package reproducibility.
*** below detection limit



v 06/13/92 (40/36in = 295.5)

v 06/13/92 01:06:45 23 Jan 1993 91-548 #103,104,105 RD85

Points DEFGH deleted;
3 points regressed out of 8 includes 80.3 % of 39Ar
Mean X = .560E-01 Mean Y = .179E-03 Slope = -.466E-01 ä+Ç .118E-02
36/40 = .278E-02 ä+Ç .660E-04 39/40 = .598E-01 ä+Ç .109E-03
Fit parameters: SUMS = .075 MSWD = .075
40Ar/36Ar = 359.24 ä+Ç 8.52 F = 16.725 ä+Ç .03 AGE = 248.67 ä+Ç 1.24 Ma



W/O POINTS DEFGH

R A W D A T A

FILE	TEMP	40Ar	39Ar	38Ar	37Ar	36Ar	TRAP	MANIFOLD
						ä regression	CURRENT	OPTION
34851	450	1120061	60394	1205	205	392	40	EALL
	▪	711	40	5	13	6		

C O R R E C T I O N S

TEMP	39Ar	37Ar	-----K-derived----			----Ca-derived----			Cl-der	Initial
C	Decay	Decay	40Ar	38Ar	37Ar	39Ar	38Ar	36Ar	36Ar	38Ar
450	81	7635	344	811	0	5	0	2	0	73

All values in counts, corrected for mass discrimination

	TEMP C	% TOT 39Ar	RAD YIELD	APP K/Ca	APP K/Cl	F	AGE (Ma)	intra-sample	precision intra-package	precision inter-package
A	450	100.0	89.7	4.00	312	16.590	252.47 ▪	.47	1.28	1.74
Total gas K/Ca =				4.0						

Precisions are 1 sigma, measured in Ma. Measured 40/36 atm = 296.5 ▪.5
J = 0.009055 ▪ 0.50% (intra-package) ▪ 0.50% (inter-package)
Trap current factors- 40: 2.26 100: 2.26 200: 1
Manifold factors- ALL: 1 SPLIT 1: 3.3 SPLIT 2: 10.89 SPLIT 3: 35.937
EALL: 2.1167 ESPLIT 1: 7.77 ESPLIT 2: 21.78
Sensitivity = 1.475E-17 % Reproducibility = .25 Detection limit = 40 counts
Data reduced assuming initial 40/36 = 295.50 ▪ 0.00
Ca-factors: 3637=2.6E-04▪1.7E-06 3837=3.2E-05▪2.4E-07 3937=6.7E-04▪3.7E-06
K-factors: 3739=0.0E+00▪2.2E-03 3839=1.3E-02▪2.4E-04 4039=5.7E-03▪4.0E-03

J = 0.009055 ▪ 0.50% SAMPLE WT = 0.0500 g

TEMP C	Initial & radiogenic 40Ar	Potassium derived 39Ar	Chlorine derived 38Ar	Calcium derived 37Ar	Initial 36Ar	AGE* in Ma	**
450	7.901E-11	4.270E-12	3.307E-14	5.546E-13	2.763E-14	252.47 ▪	.47

Note: all gas quantities are in moles. No blank correction.
* Ages calculated assuming initial 40Ar/36Ar = 295.5 ▪ 0
** 1-sigma precision estimates are for intra-sample reproducibility.
** 1-sigma precision estimates for plateaux are for intra-irradiation package reproducibility.
*** below detection limit

R A W D A T A

FILE	TEMP	40Ar	39Ar	38Ar	37Ar	36Ar	TRAP	MANIFOLD
						ä regression	CURRENT	OPTION
34832	750	3998666	234424	3149	3617	591	200	ESPLIT
	▪	2906	161	3	12	10		
34833	900	3172397	186233	2687	0	1158	200	EALL
	▪	2189	123	9	21	6		
34834	950	1932216	122700	1675	35	230	200	ESPLIT
	▪	497	64	5	15	5		
34835	1000	2311591	150069	2002	0	138	200	EALL
	▪	1099	83	8	9	4		
34836	1050	1152371	73472	994	0	134	200	EALL
	▪	523	40	7	9	4		
34837	1100	972983	61942	853	0	122	200	EALL
	▪	279	15	5	13	22		
34838	1150	1719897	110552	1485	0	151	200	EALL
	▪	341	30	15	12	2		
34839	1200	3113412	202646	2666	0	124	200	EALL
	▪	1575	98	17	16	12		

C O R R E C T I O N S

TEMP	39Ar	37Ar	-----K-derived----			----Ca-derived----			Cl-der	Initial
C	Decay	Decay	40Ar	38Ar	37Ar	39Ar	38Ar	36Ar	36Ar	38Ar
750	149	18009	1333	3146	0	15	1	6	0	110
900	118	0	1059	2499	0	0	0	0	0	217
950	78	174	698	1647	0	0	0	0	0	43
1000	95	0	854	2014	0	0	0	0	0	26
1050	47	0	418	986	0	0	0	0	0	25
1100	39	0	352	831	0	0	0	0	0	23
1150	70	0	629	1484	0	0	0	0	0	28
1200	129	0	1153	2719	0	0	0	0	-0	23

All values in counts, corrected for mass discrimination

	TEMP C	% TOT 39Ar	RAD YIELD	APP K/Ca	APP K/Cl	F	AGE (Ma)	precision intra-sample	precision intra-package	precision inter-package
A	750	41.1	95.7	5.63	4839	16.288	260.33 ▪	.27	1.25	1.74
B	900	8.9	89.2	0.00	1101	15.164	243.52 ▪	.22	1.17	1.63
C	950	21.5	96.5	304.43	4012	15.165	243.54 ▪	.20	1.16	1.63
D	1000	7.2	98.2	0.00	20609	15.103	242.61 ▪	.16	1.15	1.62
E	1050	3.5	96.5	0.00	5085	15.114	242.78 ▪	.25	1.17	1.63
F	1100	3.0	96.3	0.00	3293	15.096	242.51 ▪	1.57	1.94	2.25
G	1150	5.3	97.4	0.00	8282	15.125	242.94 ▪	.09	1.15	1.61
H	1200	9.7	98.8	0.00	0	15.154	243.38 ▪	.28	1.18	1.64

Total gas K/Ca = 67.7

Precisions are 1 sigma, measured in Ma. Measured 40/36 atm = 296.5 ▪.5
J = 0.009531 ▪ 0.50% (intra-package) ▪ 0.50% (inter-package)
Trap current factors- 40: 2.26 100: 2.26 200: 1
Manifold factors- ALL: 1 SPLIT 1: 3.67 SPLIT 2: 10.89 SPLIT 3: 35.937
EALL: 2.1167 ESPLIT 1: 7.77 ESPLIT 2: 21.78
Sensitivity = 1.475E-17 % Reproducibility = .25 Detection limit = 40 counts
Data reduced assuming initial 40/36 = 295.50 ▪ 0.00
Ca-factors: 3637=2.6E-04▪1.7E-06 3837=3.2E-05▪2.4E-07 3937=6.7E-04▪3.7E-06
K-factors: 3739=0.0E+00▪2.2E-03 3839=1.3E-02▪2.4E-04 4039=5.7E-03▪4.0E-03

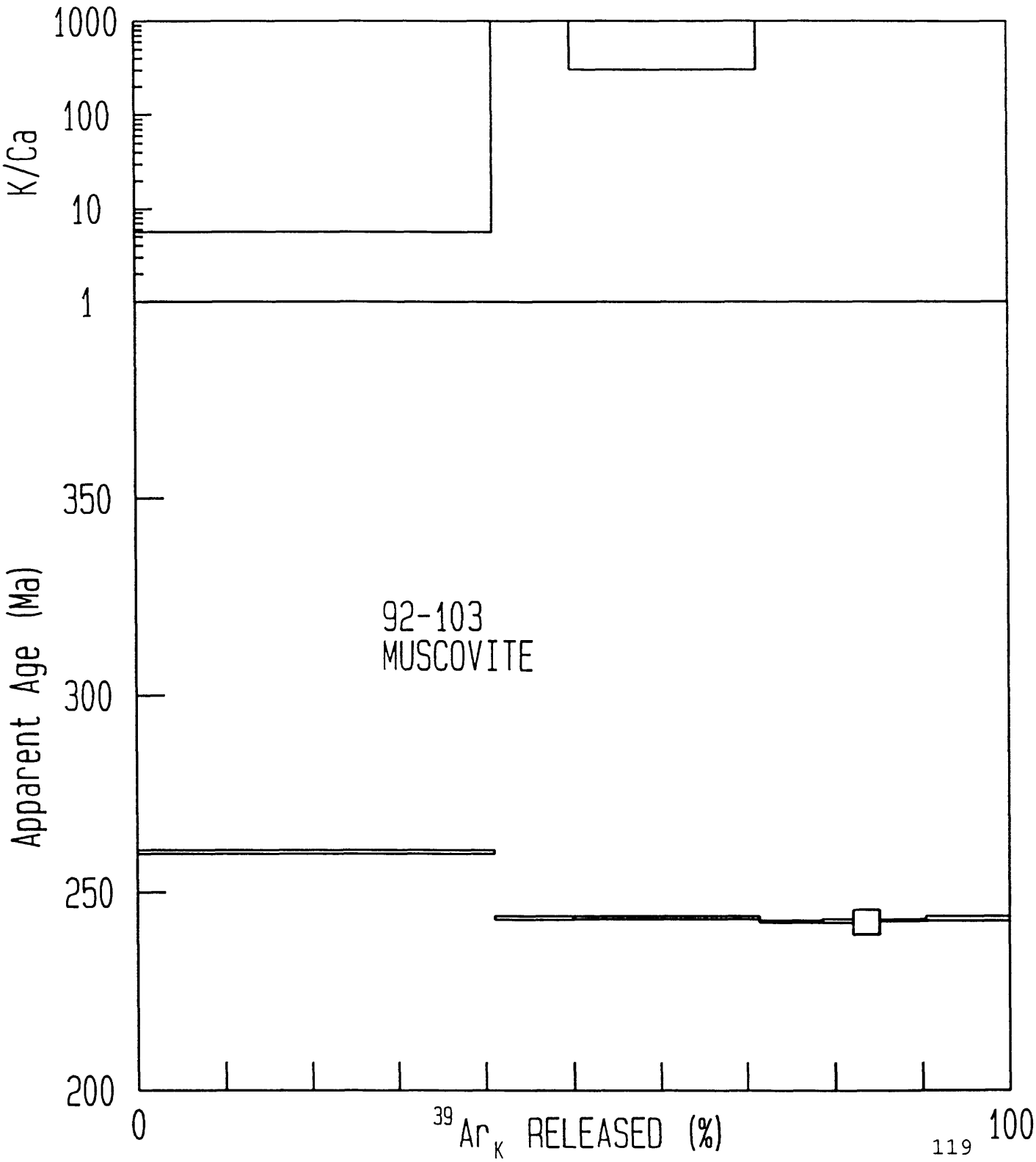
J = 0.009531 ▪ 0.50% SAMPLE WT = 0.1080 g

TEMP C	Initial & radiogenic 40Ar	Potassium derived 39Ar	Chlorine derived 38Ar	Calcium derived 37Ar	Initial 36Ar	AGE* in Ma	**
750	4.581E-10	2.690E-11	1.345E-14	2.485E-12	6.733E-14	260.33 ▪	.27
900	9.901E-11	5.823E-12	1.279E-14	***	3.626E-14	243.52 ▪	.22
950	2.214E-10	1.408E-11	8.495E-15	2.406E-14	2.640E-14	243.54 ▪	.20
1000	7.214E-11	4.692E-12	***	***	4.318E-15	242.61 ▪	.16
1050	3.597E-11	2.297E-12	***	***	4.208E-15	242.78 ▪	.25
1100	3.037E-11	1.937E-12	1.424E-15	***	3.820E-15	242.51 ▪	1.57
1150	5.368E-11	3.457E-12	***	***	4.721E-15	242.94 ▪	.09
1200	9.717E-11	6.336E-12	***	***	3.882E-15	243.38 ▪	.28
TOTAL GAS	1.068E-09	6.553E-11	3.882E-14	2.509E-12	1.509E-13	250.28	

58.9% of gas on plateau, steps 900 through 1200 PLATEAU AGE = 243.04 + 1.27

Note: all gas quantities are in moles. No blank correction.
* Ages calculated assuming initial 40Ar/36Ar = 295.5 ▪ 0
** 1-sigma precision estimates are for intra-sample reproducibility.
** 1-sigma precision estimates for plateaux are for intra-irradiation package reproducibility.
*** below detection limit

v 06/13/92 06:15:05 23 Jan 1993 92-103 #62 RD91



v 06/13/92 (40/36in = 295.5)

v 06/13/92 05:51:12 23 Jan 1993 92-103 #62 RD91

Point A deleted;

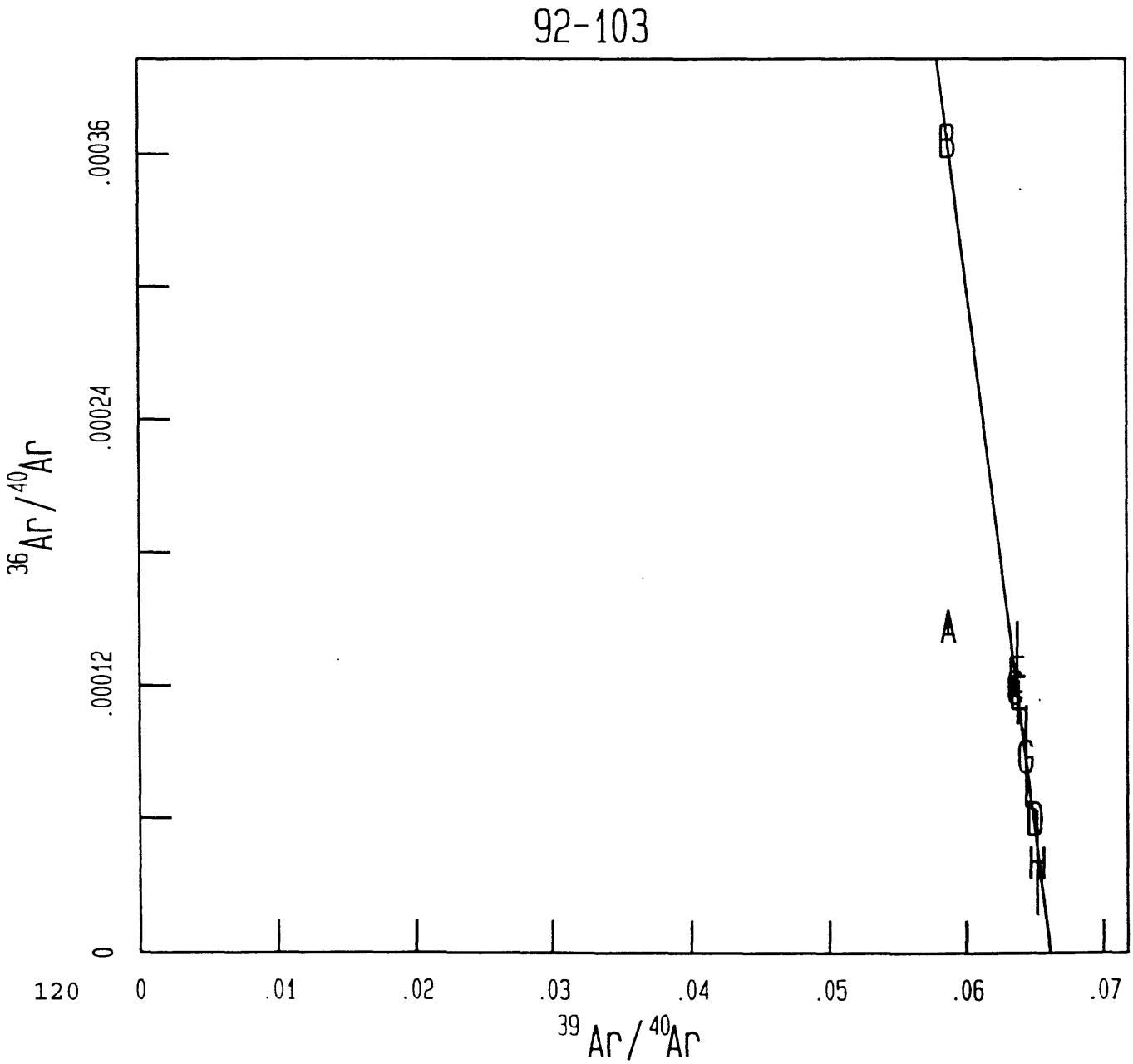
7 points regressed out of 8 includes 58.9 % of 39Ar

Mean X = .623E-01 Mean Y = .191E-03 Slope = -.498E-01 ä+Ç .994E-03

36/40 = .329E-02 ä+Ç .620E-04 39/40 = .662E-01 ä+Ç .927E-04

Fit parameters: SUMS = 2.907 MSWD = .581

40Ar/36Ar = 303.71 ä+Ç 5.72 F = 15.116 ä+Ç .021 AGE = 242.81 ä+Ç 1.18 Ma



W/O POINTS A

R A W D A T A

FILE	TEMP	40Ar	39Ar	38Ar	37Ar	36Ar ä regression	TRAP CURRENT	MANIFOLD OPTION
34650	1025	659207	37185	2412	21593	131	200	EALL
	▪	696	29	7	26	19		
34651	1050	1555483	91501	5915	52792	192	200	EALL
	▪	449	65	18	41	4		
34652	1075	2290952	135830	8734	78266	236	200	EALL
	▪	1174	104	18	56	5		
34653	1100	3495861	208292	13364	119894	313	200	EALL
	▪	1634	159	29	24	6		
34654	1125	1714926	102669	6543	58810	126	200	ESPLIT
	▪	359	50	8	79	4		
34655	1150	4607744	276203	17511	157070	306	200	EALL
	▪	2368	221	5	166	6		
34656	1175	502331	29189	1860	16536	53	200	EALL
	▪	48	9	14	21	6		
34657	1200	771416	45431	2862	25909	95	200	EALL
	▪	563	54	8	33	6		
34658	1250	2732229	162741	10340	92732	208	200	EALL
	▪	1509	120	10	37	6		

C O R R E C T I O N S

TEMP	39Ar	37Ar	-----K-derived----			----Ca-derived----			Cl-der	Initial
C	Decay	Decay	40Ar	38Ar	37Ar	39Ar	38Ar	36Ar	36Ar	38Ar
1025	22	94235	211	498	0	78	4	31	0	19
1050	54	230515	519	1225	0	191	9	75	1	22
1075	81	341933	771	1819	0	284	13	111	1	23
1100	124	524080	1182	2789	0	434	20	170	2	26
1125	61	257239	583	1375	0	213	10	84	1	8
1150	164	687407	1568	3699	0	570	27	224	2	15
1175	17	72406	166	391	0	60	3	24	0	5
1200	27	113513	258	608	0	94	4	37	0	11
1250	97	406492	924	2179	0	337	16	132	1	14

All values in counts, corrected for mass discrimination

v 06/13/92 92-102 #41,42,43,44 RD91 02:41:00 19 Jan 1993

TEMP C	% TOT 39Ar	RAD YIELD	APP K/Ca	APP K/Cl	F	AGE (Ma)	precision intra-sample	precision intra-package	precision inter-package
A 1025	2.8	95.5	.17	47	16.931	263.78 ▪	2.18	2.51	2.79
B 1050	7.0	97.8	.17	47	16.627	259.36 ▪	.21	1.23	1.73
C 1075	10.3	98.4	.17	47	16.600	258.98 ▪	.21	1.23	1.72
D 1100	15.9	98.8	.17	48	16.588	258.80 ▪	.17	1.22	1.72
E 1125	24.9	99.3	.17	48	16.587	258.79 ▪	.16	1.22	1.72
F 1150	21.0	99.5	.17	48	16.600	258.97 ▪	.16	1.22	1.72
G 1175	2.2	98.3	.17	48	16.921	263.63 ▪	.94	1.55	1.98
H 1200	3.5	97.8	.17	49	16.606	259.06 ▪	.56	1.34	1.80
I 1250	12.4	99.2	.17	48	16.657	259.80 ▪	.21	1.23	1.73
Total gas K/Ca =			.2						

Precisions are 1 sigma, measured in Ma. Measured 40/36 atm = 296.5 ▪.5
J = 0.009300 ▪ 0.50% (intra-package) ▪ 0.50% (inter-package)
Trap current factors- 40: 5.66 100: 2.26 200: 1
Manifold factors- ALL: 1 SPLIT 1: 3.3 SPLIT 2: 10.89 SPLIT 3: 35.937
EALL: 2.07 ESPLIT 1: 6.6 ESPLIT 2: 21.78
Sensitivity = 1.470E-17 % Reproducibility = .25 Detection limit = 40 counts
Data reduced assuming initial 40/36 = 295.50 ▪ 0.00
Ca-factors: 3637=2.6E-04▪1.7E-06 3837=3.2E-05▪2.4E-07 3937=6.7E-04▪3.7E-06
K-factors: 3739=0.0E+00▪2.2E-03 3839=1.3E-02▪2.4E-04 4039=5.7E-03▪4.0E-03

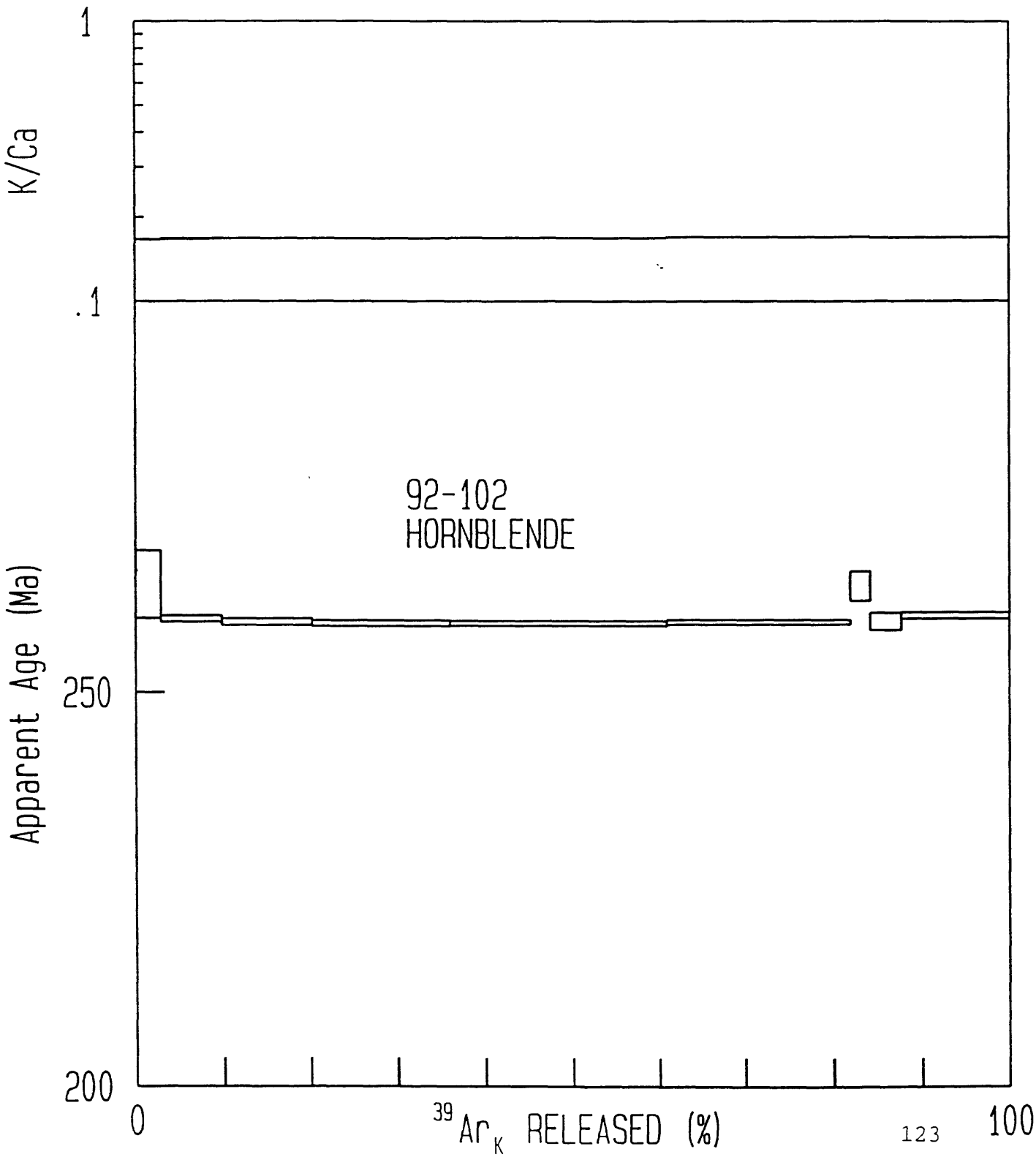
J = 0.009300 ▪ 0.50% SAMPLE WT = 1.0016 g

TEMP C	Initial & radiogenic 40Ar	Potassium derived 39Ar	Chlorine derived 38Ar	Calcium derived 37Ar	Initial 36Ar	AGE* in Ma	**
1025	2.005E-11	1.131E-12	5.884E-14	3.533E-12	3.070E-15	263.78 ▪	2.18
1050	4.732E-11	2.782E-12	1.434E-13	8.643E-12	3.561E-15	259.36 ▪	.21
1075	6.969E-11	4.130E-12	2.112E-13	1.282E-11	3.796E-15	258.98 ▪	.21
1100	1.063E-10	6.334E-12	3.227E-13	1.965E-11	4.308E-15	258.80 ▪	.17
1125	1.663E-10	9.955E-12	5.023E-13	3.074E-11	4.082E-15	258.79 ▪	.16
1150	1.402E-10	8.399E-12	4.209E-13	2.576E-11	2.483E-15	258.97 ▪	.16
1175	1.528E-11	8.876E-13	4.487E-14	2.713E-12	***	263.63 ▪	.94
1200	2.347E-11	1.382E-12	6.893E-14	4.253E-12	1.772E-15	259.06 ▪	.56
1250	8.311E-11	4.949E-12	2.488E-13	1.523E-11	2.290E-15	259.80 ▪	.21
TOTAL GAS	6.717E-10	3.995E-11	2.022E-12	1.233E-10	2.624E-14	259.27	

79.1% of gas on plateau, steps 1050 through 1150 PLATEAU AGE = 258.95 + 1.35

Note: all gas quantities are in moles. No blank correction.
* Ages calculated assuming initial 40Ar/36Ar = 295.5 ▪ 0
** 1-sigma precision estimates are for intra-sample reproducibility.
** 1-sigma precision estimates for plateaux are for intra-irradiation package reproducibility.
*** below detection limit

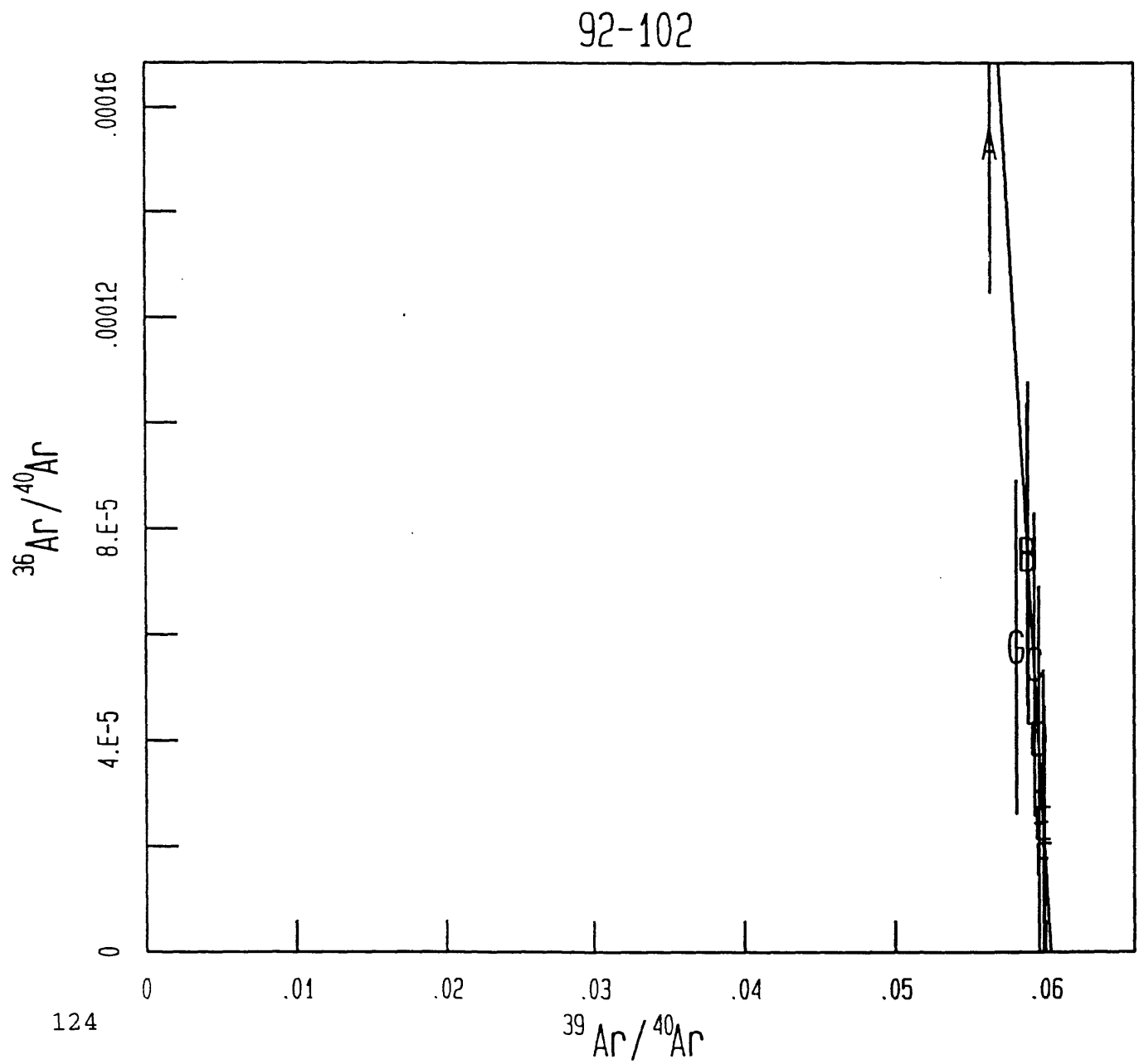
v 06/13/92 02:41:45 19 Jan 1993 92-102 #41,42,43,44 RD91



v 06/13/92 (40/36in = 295.5)

v 06/13/92 02:47:29 19 Jan 1993 92-102 #41,42,43,44 RD91

Points AGHI deleted;
5 points regressed out of 9 includes 79.1 % of 39Ar
Mean X = .595E-01 Mean Y = .427E-04 Slope = -.505E-01 ä+Ç .316E-01
36/40 = .305E-02 ä+Ç .188E-02 39/40 = .603E-01 ä+Ç .588E-03
Fit parameters: SUMS = .017 MSWD = .006
40Ar/36Ar = 328.37 ä+Ç 202.37 F = 16.577 ä+Ç .162 AGE = 258.64 ä+Ç 2.64 Ma



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W/O POINTS AGHI

R A W D A T A

FILE	TEMP	40Ar	39Ar	38Ar	37Ar	36Ar	TRAP	MANIFOLD
					ä regression		CURRENT	OPTION
34848	450	921039	59853	3834	0	46	40	EALL
	▪	417	16	24	7	7		

C O R R E C T I O N S

TEMP	39Ar	37Ar	-----K-derived----			----Ca-derived----			Cl-der	Initial
C	Decay	Decay	40Ar	38Ar	37Ar	39Ar	38Ar	36Ar	36Ar	38Ar
450	38	0	340	803	0	0	0	0	1	9

All values in counts, corrected for mass discrimination

	TEMP C	% TOT 39Ar	RAD YIELD	APP K/Ca	APP K/Cl	F	AGE (Ma)	intra-sample	precision intra-package	precision inter-package
A	450	100.0	98.5	0.00	48	15.135	242.42 ▪	.53	1.25	1.69
Total gas K/Ca =				0.0						

Precisions are 1 sigma, measured in Ma. Measured 40/36 atm = 296.5 ▪.5
J = 0.009503 ▪ 0.50% (intra-package) ▪ 0.50% (inter-package)
Trap current factors- 40: 2.26 100: 2.26 200: 1
Manifold factors- ALL: 1 SPLIT 1: 3.67 SPLIT 2: 10.89 SPLIT 3: 35.937
EALL: 2.1167 ESPLIT 1: 7.77 ESPLIT 2: 21.78
Sensitivity = 1.475E-17 % Reproducibility = .25 Detection limit = 40 counts
Data reduced assuming initial 40/36 = 295.50 ▪ 0.00
Ca-factors: 3637=2.6E-04▪1.7E-06 3837=3.2E-05▪2.4E-07 3937=6.7E-04▪3.7E-06
K-factors: 3739=0.0E+00▪2.2E-03 3839=1.3E-02▪2.4E-04 4039=5.7E-03▪4.0E-03

J = 0.009503 ▪ 0.50% SAMPLE WT = 0.0255 g

TEMP C	Initial & radiogenic 40Ar	Potassium derived 39Ar	Chlorine derived 38Ar	Calcium derived 37Ar	Initial 36Ar	AGE* in Ma	**
450	6.496E-11	4.229E-12	2.149E-13	***	3.221E-15	242.42 ▪	.53

Note: all gas quantities are in moles. No blank correction.
* Ages calculated assuming initial 40Ar/36Ar = 295.5 ▪ 0
** 1-sigma precision estimates are for intra-sample reproducibility.
** 1-sigma precision estimates for plateaux are for intra-irradiation package reproducibility.
*** below detection limit

ACKNOWLEDGEMENT

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