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$^{40}Ar/^{39}Ar$ Age-Spectrum Data for the Davis Mountains, Trans-Pecos volcanic field, Texas

by

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INTRODUCTION

The Davis Mountains are the largest single part of the Trans-Pecos Texas volcanic field, which is the largest alkalic province in North America. The Davis Moutains are similar to other mid-Cenozoic volcanic fields, such as the San Juan Mountains of Colorado and the Mogollon-Datil field of New Mexico with several important exceptions. First, significant intermediate volcanism did not precede silicic activity. Erupted rocks were dominantly silicic (>65% SiO_2), and accompanied by lesser intermediate and mafic rocks. Secondly, Davis Mountains rocks are alkalic; peralkaline rocks are common, and even metaluminous varieties are highly alkalic, having 10 to 11% total alkalis at 70% SiO_2.

The most extraordinary difference from other silicic volcanic fields is that most of the major volcanic units of the Davis Mountains were emplaced as large volume, extensive, silicic lavas (Parker and McDowell, 1979; Henry and others, 1988, 1989). In fact, the Star Mountain Formation of the eastern Davis Mountains was probably the first recognized extensive silicic lava (Gibbon, 1969). Similar extensive silicic lavas are now known to occur worldwide and have been termed flood rhyolites (Henry and Wolff, 1992). The origin and emplacement mechanisms and distinction from highly rheomorphic or "lava-like" tuffs are actively debated (Bonnichsen and Kauffman, 1987; Milner and others, 1992; Henry and Wolff, 1992; Branney and Kokelaar, 1992). In contrast to most silicic volcanic fields, ash-flow tuffs are rare in the Davis Mountains; only two major ash-flow sheets are well documented. Few calderas have been identified, which, given the paucity of ash-flow sheets, is not surprising.

These unusual characteristics have attracted considerable attention, which has focused on understanding the origin of the magmas, their relation to regional tectonism, and mechanisms of eruption and emplacement. The origin of the alkalic silicic rocks and the relative contributions of mantle and crust have been major topics with various authors suggesting a range from dominantly fractional crystallization of mantle-derived magmas to crustal melting for individual rocks, postulated suites, or the whole field (Parker, 1983, 1986, 1989; McDonough and Nelson, 1984; Nelson and others, 1987; Ward and others, 1987; Ward and Walker, 1991; Wolff, 1989; Wolff and Davidson, 1990; James and Henry, 1991, 1993).

These volcanologic and petrogenetic studies are hampered by the incomplete understanding of the timing of activity, of correlations between units, of the distribution and timing of individual volcanic centers, and of what volcanic units erupted from which centers. The basic stratigraphy in the southern and eastern Davis Mountains was established by Eifler (1951), Anderson (1968), Parker and McDowell (1979), Twiss (1979), and McKalips and others (1982), and Parker and McDowell demonstrated that magmatism occurred between 38 and 35 Ma. Documented or proposed volcanic centers include two major calderas and several smaller volcanos (Parker, 1983, 1986; Hoy, 1986; Henderson, 1987). However, geologic maps of these centers either are not published or reside only in theses. Correlation has been hampered both by complex volcanic stratigraphy and by difficulty in

distinguishing extensive lavas and highly rheomorphic tuffs. Geologic units were misidentified and miscorrelated in much of the earlier geologic mapping.

We combined detailed geologic mapping with high-precision $^{40}Ar/^{39}Ar$ geochronology in an attempt to establish a comprehensive stratigraphic framework, identify source areas and related volcanic rocks, clarify the eruptive and emplacement mechanisms of the lavas and tuffs, and provide a basis for better petrogenetic studies. This report supplies a complete listing of the basic analytical data that was measured at the USGS in Reston, which are used by Henry and others (in prep.) to construct an overall chronology of volcanism in the Davis Mountains.

SAMPLING STRATEGY

Samples were collected to represent the complete stratigraphic range of volcanic rocks in the eastern and southern Davis Mountains. Several prominent and well-mapped marker beds were sampled in several geographic locations to test the precision of $^{40}Ar/^{39}Ar$ dating. These include the (1) Gomez Tuff, a wide-spread, peralkaline rhyolitic ash-flow tuff; (2) the Barrel Springs Formation, which is either a strongly rheomorphic ash-flow tuff or an extensive silicic lava; and (3) the informal Wild Cherry tuff (Henry and others, in prep.), a thin but widespread, rhyolitic ash-flow tuff. High-temperature, alkali feldspar phenocrysts are ideally suited for $^{40}Ar/^{39}Ar$ geochronology. Therefore, all samples consisted of fresh volcanic rocks that contain clear, unaltered feldspar phenocrysts.

METHODS

Sample Preparation

All samples were crushed, ground, and sieved. For feldspars, the fraction between 250 μm and 180 μm was passed several times through a Frantz isodynamic separator to remove magnetic material and to concentrate alkali feldspar phenocrysts in the nonmagnetic fraction. Concentrates consisting of 95 to 98% feldspar were then leached with 5% HF for 30 minutes followed by ultrasonic abrasion for 2 minutes to remove adhering groundmass and other impurities. The sample was further concentrated by magnetic methods and passed through diluted Bromoform to remove altered feldspars, composite grains, or quartz; the latter is not a phenocryst phase in any of the samples of this study so is rarely a contaminant. The sample was then leached a second time with 5% HF followed by ultrasonic abrasion for 2 minutes. Samples were sieved a second time to remove material less than 100 mesh created by HF leach and abrasion. Samples were observed with a binocular microscope using reflected light and in immersion oils with a polarizing microscope using transmitted light. Final samples were all greater than 99.9% pure; the primary contaminant consisted of small melt inclusions within feldspar phenocrysts. The sized amphibole bearing sample was passed through bromoform and methylene iodide to remove both less and more dense minerals before further concentration in the magnetic separator. The

sample was then ultrasonically cleaned resized and finally concentration was completed again using heavy liquids and the magnetic seperator. The purity of the amphibole separate was greater than 99.9%.

Approximately 250 mg of anorthoclase, 1000 mg of plagioclase, and 1000 mg. of amphibole, were packaged in aluminum or tin 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(Dalrymple and others,1981. The primary monitor mineral was sanidine from the Fish Canyon Tuff which has an age of 27.79 Ma (Kunk and others, 1985, Cebla and others, 1986) when compared to MMHb-1 hornblende at an age of 519.4 ± 2.5 Ma (Alexander and others, 1978; Dalrymple and others, 1981). The type of irradiation container used, and the geometry of samples and standards in that container is similar to that described by Snee and others (1988).

Sample Analysis

The samples in this study were analyzed over a period of five years and the analytical technique varied somewhat over that period of time as blanks in the argon masss range were reduced and the $^{40}Ar/^{39}Ar$ mass spectrometer system was increasingly automated.

All samples were analyzed on a VG Isotopes, Ltd., Model 1200B Mass Spectrometer at the U.S. Geological Survey, Reston, using the step heating method. Heating for 10 to 15 minutes per step followed a schedule of 3-9 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 first purification manifold were evacuated as necessary by an isolatable turbomolecular pump. Two isolatable ion pumps evacuated the second purification manifold and the analyzer. During normal operation, the gas to be analyzed was purified in the first manifold by a SAES ST707 Zr-V-Fe getter operated at room temperature, and a cold finger at LN_2 temperature. Gas was equilibrated with the second manifold, then isolated and cleaned in the front manifold by a SAES ST101 Al-Zr getter operated at 400°C and a Ti getter operated at 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 equilibration of the argon dominated gas with the mass spectrometer. The argon-rich gas was further purified in the mass spectrometer by a second SAES ST101 getter operated at room temperature. Masses 40 through 36 were analyzed as a function of time in five cycles. The mass peaks and their baselines, were measured as five second integrations in each of the five cycles. After subtraction of baselines from measured peak values, the data for each peak were linearly regressed to estimate their values at T_0, the time of inlet of the gas to the mass spectrometer. After the

analysis, the mass spectrometer was evacuated. If necessary, the fraction of gas remaining in the second manifold could be introduced into the mass spectrometer for a replicate or "split" analysis.

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). 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 and others (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, and the inital $^{38}Ar/^{36}Ar$ ratio (Haugerud and Kunk, 1988).

Sensitivities in moles ^{40}Ar/count were calculated from analytical results on Minnesota hornblende MMHb-1 and its published composition (Alexander and others, 1978), and these sensitivity values are included at the bottom of the second data table for each sample.

The tables and figures below include the identification of plateau ages, preferred ages, isochron ages, and total gas ages. Plateau ages include two or more contiguous steps that overlap in age within experimental error, and whose cumulative $^{39}Ar_K$ comprises greater than 50% of the total potassium derived ^{39}Ar (Snee and others., 1988). For a small number of samples a preferred age was calculated on a group of contiguous temperature steps that were similiar in age but that for reasons of the quantity of gas included or a somewhat larger variance in age, did not meet the plateau criteria described above. A small number of the samples analyzed for this study were examined for colinearity on isotope correlation diagrams to assess if they contained any resolvable apparent non-atmospheric argon components trapped in them and to calculate an isochron age. In several instances, points that were deemed to be not collinear were deleted from the isotope correlation diagram. 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 ages are essentially equivalent to conventional K/Ar ages. No estimate of analytical precision is assigned to total gas ages.

SAMPLE DESCRIPTIONS

Locations and descriptions of samples for $^{40}Ar/^{39}Ar$ dating of volcanic rocks of the Davis Mountains are presented below. Petrographic observations were made on single thin sections that were generally cut perpendicular to eutaxitic texture in ash-flow tuffs or to flow bands in lavas.

H88-87 30°32.3'N, 103°50.9'W; Fort Davis Southeast 7.5 minute quadrangle

Location: Road cut along Highway 118 southeast of Fort Davis, Texas

Map Unit: Weston laccolith (informal); peralkaline rhyolitic laccolith that intrudes Frazier Canyon Formation

Description: Sparsely porphyritic rhyolite, flow banded, slightly miarolitic

Phenocrysts:

Alkali feldspar: 2 to 3% to 2 mm, commonly as glomerocrysts; clear, unzoned

Clinopyroxene: 1% to 1 mm

Magnetite: <1% to 0.2 mm

Apatite: <1% to 0.2 mm

Zircon: <<1% to 0.05 mm

Groundmass

Fine, flow banded aggregate of alkali feldspar laths with interstitial quartz and minor arfvedsonite.

BD-1 30°30.2'N, 103°45.9'W; Fort Davis Southeast 7.5 minute quadrangle

Location: Outcrop on flank of Barillos dome, southeastern part of quadrangle

Map Unit: Barillos dome (informal); peralkaline rhyolite laccolith that intrudes Huelster and Star Mountain Formations

Description: Moderately porphyritic rhyolite, flow banded, miarolitic

Phenocrysts:

Alkali feldspar: 7 to 10%, 2 to 4 mm; clear,

Clinopyroxene: <1%, to 1 mm

Magnetite: <<1% to 0.4 mm

Zircon: <<1% to 0.1 mm

Groundmass

Fine, flow banded aggregate of alkali feldspar laths with interstitial quartz, arfvedsonite, clinopyroxene, and aenigmatite.

Gor-2A 30°26.4'N, 103°51.4'W; Mitre Peak 7.5 minute quadrangle

Location: Outcrop north of Barrilos Creek, west-central part of quadrangle, along former county road between Marfa and highway 1837

Map Unit: Unnamed peralkaline rhyolitic intrusion west of and part of Mitre

Peak group of intrusions.

Description: Sparsely porphyritic, peralkaline rhyolite

Phenocrysts:

Alkali feldspar: 2% to 3 mm; clear, unzoned, Carlsbad twins

Arfvedsonite: <1% to 0.5 mm

Groundmass

Trachytic aggregate of alkali feldspar laths, quartz, poikilitic arfvedsonite, and sodic pyroxene

H89-47

Location: 30° 40.3'N, 103°59.2'W; Casket Mountain 7.5 minute quadrangle. Outcrop on mesa in west-central part of quadrangle near elevation 6304

Map Unit: Rhyolitic lava flow of informal Casket Mountain lavas (Henry and others, in prep.)

Description: Rhyolite lava, upper vitrophyre

Phenocrysts:

Alkali feldspar: 14%, 1 to 5 mm, commonly as glomerocrysts; mostly clear, unzoned, Carlsbad twinned grains, some of which are microperthitic; some mottled anorthoclase? with clinopyroxene inclusions

Clinopyroxene: 1% to 0.8 mm

Opaque: 1% to 0.3 mm; commonly as glomerocrysts with clinopyroxene

Apatite: <<1% to 0.1 mm; in glomerocrysts with clinopyroxene and opaque

Groundmass

Glass with microlites of alkali feldspar and clinopyroxene (?) and a few spherulites

H89-8

Location: 30° 47.5'N, 10°45.3'W; Big Aguja Mountain 7.5 minute quadrangle. Outcrop in Barrilla syncline, east edge of quadrangle

Map Unit: Rhyolitic lava flow of informal Casket Mountain lavas (Henry and others, in prep.); formerly mapped as part of Barrel Springs Formation (Twiss, 1979)

Description: Rhyolitic lava flow; sample from massive interior

Phenocrysts:

Alkali feldspar: 20% to 10 mm as individual grains and glomerocrysts; commonly microperthitic and Carlsbad twins; some anorthoclase cores and slight zoning

Clinopyroxene: 1% to 1 mm, mostly within glomerocrysts

Opaques (magnetite?):

Zircon: euhedral grains commonly with opaques

Apatite: <<1% to 0.06 mm

Groundmass

Devitrified glass: intergrown alkali feldspar and quartz ("snowflake" texture)with opaques (magnetite?) and tridymite

H89-153 30° 34.2'N, 104°00.9'W; Blue Mountain 7.5 minute quadrangle
Location: Outcrop near top of Blue Mountain, west-central part of quadrangle

Map Unit: Rhyolitic lava flow of informal Casket Mountain lavas (Henry and others, in prep.); formerly mapped as part of Barrel Springs Formation (Twiss, 1979)
Description: Rhyolitic lava flow: sample from devitrified zone immediately above base
Phenocrysts:
Alkali feldspar: 18% as individual grains to 8 mm and glomerocrysts to 15 mm; clear, slightly zoned, Carlsbad twins
Clinopyroxene: 2% to 1 mm as individual grains and glomerocrysts with alkali feldspar
Opaque: <1% to 0.3 mm
Apatite: <<1% to 0.1 mm
Groundmass
Intergrown alkali feldspar laths, minor quartz, clinopyroxene, and opaque (magnetite?)

H89-12 30° 38.6'N, 103°57.0'W; Casket Mountain 7.5 minute quadrangle
Location: Outcrop on flank of Casket Mountain, southeastern part of quadrangle
Map Unit: Rhyolitic lava flow of informal Casket Mountain lavas (Henry and others, in prep.); formerly mapped as part of Barrel Springs Formation (Twiss, 1979)
Description: Rhyolitic lava flow: sample from uppr vitrophyric breccia
Phenocrysts:
Alkali feldspar: 20% to 9 mm as individual grains and common glomerocrysts; clear, Carlsbad twinned, some slight zoning, some with anorthoclase cores
Clinopyroxene: 2% to 1.5 mm: partly altered to aggregates of opaques
Opaques: <1% to 0.2 mm
Apatite: <1% to 0.8 mm
Groundmass
Glass with perlitic cracks

GKR-1 30°28.0'N, 103°48.5'W; Mitre Peak 7.5 minute quadrangle
Location: Outcrop on mesa north of Antelope Peak and Barillos Creek, north-central part of quadrangle
Map Unit: Rhyolitic lava flow of informal lavas of Casket Mountain (Henry

and others, in prep.); formerly mapped as part of Barrel Springs Formation (Gorski, 1970; Twiss, 1979); K-Ar data reported in Henry and others (1986)

Description: Rhyolitic lava flow; sample from massive interior; trachytic
Phenocrysts:
Alkali feldspar (anorthoclase): 25% as individual grains to 8 mm and as glomerocrysts to 15 mm; largest are zoned and show mottled extinction and sieve texture; grid twins; some microperthitic
Clinopyroxene:
Groundmass
alkali feldspar laths and minor quartz

J87-41 30° 31.5'N, 104°12.7'W; Paradise Mountain 7.5 minute quadrangle
Location: Outcrop on ridge south of J87-44, southwestern part of quadrangle
Map Unit: Informal Wild Cherry tuff (Henry and others, in prep.); formerly mapped as part of Barrel Springs Formation (Twiss, 1979); upper part of caldera-filling ash-flow tuff in Paradise Mountain caldera (Henderson, 1989)
Description: Rhyolitic ash-flow tuff;
Phenocrysts:
Alkali feldspar: 4% to 5 mm as individual grains and glomerocrysts
Clinopyroxene: 1-2% to 1 mm; mostly oxidized to opaque aggregates; clear, unzoned, Carlsbad twins
Opaque: <1% to 0.1 mm
Zircon: <<1% to 0.05 mm
Groundmass
Poikilitic intergrowth of alkali feldspar and quartz (snowflake texture); some possible arfvedsonite

J87-44 30° 31.5'N, 104°12.7'W; Paradise Mountain 7.5 minute quadrangle
Location: Road cut along highway 166, southwestern part of quadrangle
Map Unit: Informal Wild Cherry tuff (Henry and others, in prep.); formerly mapped as part of Barrel Springs Formation (Twiss, 1979); lower part of caldera-filling ash-flow tuff in Paradise Mountain caldera (Henderson, 1989)
Description: Rhyolitic ash-flow tuff; densely welded, foliated
Phenocrysts:
Alkali feldspar: 8% to 4 mm as individual grains and to 8 mm as glomerocrysts; clear, unzoned, Carlsbad twins
Clinopyroxene: 1%; almost entirely oxidized to opaque aggregates; as glomerocrysts with alkali feldspar
Opaque (probably magnetite): <1% to 0.2 mm

Zircon: <<1% to 0.1 mm
Groundmass
Poikilitic and spherulitic intergrowth of alkali feldspar and quartz (snowflake texture)

H89-151 30° 34.4'N, 104°00.6'W; Blue Mountain 7.5 minute quadrangle
Location: Outcrop on east flank of Blue Mountain, east-central part of quadrangle
Map Unit: Informal Wild Cherry tuff (Henry and others, in prep.); formerly mapped as part of Barrel Springs Formation (Smith, 1975; Twiss, 1979)
Description: Rhyolitic ash-flow tuff; porphyritic, densely welded
Phenocrysts:
Alkali feldspar: 12%, 1 to 5 mm as individual grains and glomerocrysts; clear, unzoned, Carlsbad twins; some broken grains; rare microperthite
Clinopyroxene: 1-2% to 1 mm; mostly oxidized to opaque aggregates
Opaque (probably magnetite): <1% to 0.4 mm equant grains
Zircon: <<1% to 0.1 mm
Groundmass
Flattened, devitrified glass shards; some probable pumice fragments to several cm.

H89-143 30° 37.7'N, 103°58.3'W; Casket Mountain 7.5 minute quadrangle
Location: Outcrop on flank of small mesa, southwestern part of quadrangle
Map Unit: Informal Wild Cherry tuff (Henry and others, in prep.); formerly mapped as part of Barrel Springs Formation (Twiss, 1979)
Description: Rhyolitic ash-flow tuff; porphyritic,
Phenocrysts:
Alkali feldspar: 7% to 4 mm as individual grains and glomerocrysts; unzoned, Carlsbad twins, common microperthite
Clinopyroxene: 1% to 1 mm; mostly oxidized to opaque aggregates
Opaque (probably magnetite): <1% to 0.5 mm
Zircon: mostly associated with opaques
Groundmass
Flattened, devitrified glass shards and rare pumice to 2 cm; tridymite in vapor-phase? cavities

BS-3 30° 49.7'N, 103°47.5'W; Big Aguja Mountain 7.5 minute quadrangle
Location: Outcrop on side of mesa in middle of Barrilla syncline, approximately 0.8 km south of Seven Springs Ranch headquarters

Map Unit: Informal Wild Cherry tuff (Henry and others, in prep.); 2-m thick distal outcrop; formerly mapped as part of Barrel Springs Formation (Twiss, 1979); sample from Parker and McDowell (1979), who reported K-Ar and petrographic data

Description: Rhyolitic ash-flow tuff; slightly welded to nonwelded,

Phenocrysts:

Alkali feldspar: 3% to 1 mm; clear, unzoned, commonly broken grains

Clinopyroxene: <1% to 0.5 mm; commonly oxidized to opaque aggregates

Fayalite?: <1% to 0.3 mm; iddingsitized

Opaque: <<1% to 0.1 mm

Groundmass

Slightly welded glass shards and fine pumice

H89-174 30° 40.1'N, 104°02.2'W; Fort Davis Southeast 7.5 minute quadrangle

Location: Road cut along Highway 118 below McDonald Observatory

Map Unit: Mt Locke Formation (Anderson, 1968; Twiss, 1979); trachyte lava flow that overlies Barrel Springs Formation in central Davis Mountains

Description: Coarsely and abundantly porphyritic trachyte lava flow

Phenocrysts:

Calcic anorthoclase: 30%, rhombic to 20mm; many glomerocrysts; mostly calcic anorthoclase, some with cores of highly mottled (sieve textured) anorthoclase or plagioclase and clear, untwinned rims of probable sanidine; strongly zoned; grid twinning

Sanidine: 2% to 3 mm; clear, untwinned individual grains and as rims on anorthoclase

Plagioclase: 3%, as cores within anorthoclase and rare individual grains

Altered olivine: 2% to 1 mm; oxidized

Zircon: rare euhedral grains

Groundmass

mostly alkali feldspar with opaques and fine ?, probably alteration of glass

H89-158B 30° 33.8'N, 104°00.7'W; Blue Mountain 7.5 minute quadrangle

Location: Outcrop on south face of Blue Mountain, east-central part of quadrangle

Map Unit: Basalt lava flow within unnamed tuffaceous sedimentary sequence between Barrel Springs Formation and informal Casket Mountain lavas (Henry and others, in prep.)

Description: Basalt

Phenocrysts:

Plagioclase: 3% to 20 mm long laths; clear, twinned, subhedral, unzoned to slightly zoned; rare mottled extinction

Magnetite: 1% to 1 mm; anhedral, embayed

Groundmass

Plagioclase laths with subophitic clinopyroxene (Titanaugite?), abundant opaques (probably magnetite), minor olivine (altered to serpentine), apatite, and altered interstitial glass

H89-173 30° 39.9'N, 104°01.8'W; Mount Locke 7.5 minute quadrangle

Location: Road cut along Highway 118, below McDonald Observatory

Map Unit: Barrel Springs Formation (McKalips and others, 1979; Parker and McDowell, 1979; Henry and others, in prep.)

Description: Rhyolitic ash-flow tuff or lava; porphyritic, strongly flow banded

Phenocrysts:

Alkali feldspar: 10% 0.5 to 4 mm as individual grains and as glomerocrysts up to 6 mm; largest grains are slightly zoned; some microperthite

Clinopyroxene: 2% to 1 mm, commonly altered to opaque aggregates

Opaques: <1% to 0.5 mm

Zircon: <1%, commonly with opaques

Groundmass

Devitrified aggregate of alkali feldspar and quartz ("snowflake" texture) with opaque; faint swirling texture is either flow banding or flattened shards

BS-4 30° 50.1'N, 103°47.5'W; Big Aguja Mountain 7.5 minute quadrangle

Location: Outcrop in stream cut adjacent to Seven Springs Ranch headquarters, in middle of Barrilla syncline

Map Unit: Barrel Springs Formation (McKalips and others, 1979; Parker and McDowell, 1979; Henry and others, in prep.); sample from Parker and McDowell (1979), who reported K-Ar and petrographic data

Description: Rhyolitic ash-flow tuff or lava; porphyritic,

Phenocrysts:

Alkali feldspar: 12%, 2 to 5 mm; clear, some zoned, Carlsbad twins

Clinopyroxene?: 0.6% to 0.5 mm; altered to opaque aggregates

Fayalite?: <1% to 0.5 mm; altered to iddingsite

Zircon: <<1% to 0.05 mm

Groundmass

Intergrown alkali felspar and poikilitic quartz (snowflake texture), opaque minerals, and possible aenigmatite

J87-67 30° 35.9'N, 103°55.3'W; Fort Davis 7.5 minute quadrangle
Location: Road cut on "Scenic Drive", Davis Mountains State Park
Map Unit: Barrel Springs Formation (McKalips and others, 1979; Parker and McDowell, 1979; Henry and others, in prep.)
Description: Rhyolitic ash-flow tuff; foliated, locally flow folded and brecciated
Phenocrysts:
Alkali feldspar: 10%, 2 to 4 mm; mostly euhedral but some broken grains and glomerocrysts to 6 mm; clear, slightly zoned from Or_{34} to Or_{46}
Clinopyroxene: 1% to 1 mm; mostly oxidized to opaque aggregates
Opaque: <1% to 0.1 mm; probably magnetite
Zircon: <<1% to 0.1 mm
Groundmass
Devitrified aggregate of alkali feldspar and quartz; slight poikilitic, snowflake texture

BS-1 30° 35.8'N, 103°55.2'W; Fort Davis 7.5 minute quadrangle
Location: Road cut on "Scenic Drive", Davis Mountains State Park
Map Unit: Barrel Springs Formation (McKalips and others, 1979; Parker and McDowell, 1979; Henry and others, in prep.); sample from Parker and McDowell (1979), who reported K-Ar and petrographic data
Description: Rhyolitic ash-flow tuff; foliated and flow folded, petrographically identical to sample J87-67

J87-65 30° 35.9'N, 103°55.5'W; Fort Davis 7.5 minute quadrangle
Location: Road cut on "Scenic Drive", Davis Mountains State Park
Map Unit: Barrel Springs Formation (McKalips and others, 1979; Parker and McDowell, 1979; Henry and others, in prep.); basal ash-flow tuff below BS-1 and J87-67
Description: Rhyolitic ash-flow tuff; nonwelded to densely welded
Phenocrysts:
Alkali feldspar: 10%, 2 to 4 mm; mostly euhedral but some broen grains and glomerocrysts to 6 mm; clear, slightly zoned from Or_{34} to Or46
Clinopyroxene?: 1% to 1 mm; altered to opaque aggregates
Opaque: <1% to 0.1 mm; probably magnetite
Zircon: <<1% to 0.05 mm
Groundmass
Largely unflattened glass shards and pumice (up to 20 cm long in outcrop); sparse trachyte lithic fragments to 2 cm

H89-23 30° 50.3'N, 103°57.7'W; Little Aguja Mountain 7.5 minute quadrangle

Location: Outcrop near top of Timber Mountain, northwestern part of quadrangle

Map Unit: Mapped previously (McKalips and others, 1979) as Sheep Pasture Formation, but probably part of Barrel Springs Formation (Henry and others, in prep.)

Description: Rhyolitic lava flow: sample from upper vitrophyre

Phenocrysts:

Alkali feldspar: 5%, as individual grains and glomerocrysts, <1 to 4 mm, clear, some with slight zoning, Carlsbad twins, or microperthite

Clinopyroxene: 1-2% to 1mm; rims oxidized to aggregates of opaques

Magnetite: <1% to 0.1 mm

Zircon: <<1% to 0.1 mm

Apatite: <1% to 0.1 mm

Groundmass

Glassy, flow banded, scattered microlites of alkali feldpsar

21-9 30° 36.0'N, 103°54.9'W; Fort Davis 7.5 minute quadrangle

Location: Road cut on south side of Highway 118, 3 km west of intersection with Highway 17, northwest of Fort Davis

Map Unit: Sleeping Lion Formation (McKalips and others, 1979; Parker and McDowell, 1979); sample from Parker and McDowell (1979), who reported K-Ar and petrographic data

Description: Rhyolitic lava flow; coarsely porphyritic,

Phenocrysts:

Alkali feldspar: 20 to 25% up to 25 mm in diameter; commonly chatoyant and with faint grid twins

Clinopyroxene: 1 to 3% to 1.5 mm,

Magnetite: <1% to 0.5mm, commonly with clinopyroxene

Zircon: <<1% to 0.1 mm, commonly with clinopyroxene

Groundmass

Intergrown alkali feldspar and quartz ("snowflake" texture)

J87-62 30° 32.6'N, 103°51.4'W; Fort Davis SE 7.5 minute quadrangle

Location: Road cut along Highway 118 southeast of Fort Davis

Map Unit: Sleeping Lion Formation (McKalips and others, 1979; Parker and McDowell, 1979)

Description: Rhyolitic lava flow; coarsely porphyritic,

Phenocrysts:

Alkali feldspar: 25% up to 20 mm in diameter; some

glomerocrysts with other phenocryst phases; commonly chatoyant and with faint grid twins
Clinopyroxene: 1 to 3% to 1.5 mm,
Magnetite: <1% to 0.5mm, commonly with clinopyroxene
Zircon: <<1% to 0.1 mm, commonly with clinopyroxene
Groundmass
Intergrown alkali feldspar and quartz ("snowflake" texture)

85201 30°43.1'N, 104°19.4'W; El Muerto 7.5 minute quadrangle
Location: Outcrop on southwest flank of hill 6412, Yates Canyon, northcentral part of quadrangle
Map Unit: Moore Tuff (name from Hoy, 1986); rhyolitic ash-flow tuff
Description: Abundantly porphyritic rhyolitic ash-flow tuff
Phenocrysts:
Alkali feldspar: 10-25% to 5 mm; clear, unzoned, commonly chatoyant, Carlsbad twins
Clinopyroxene?: 1% to 1 mm; completely oxidized to aggregates of iron oxides
Groundmass
Densely welded, devitrified with granophyric texture of quartz, alkali feldspar, and minor arfvedsonite, largely obscuring primary vitroclastic texture; lithic fragments of diverse igneous rocks

PP37 30° 18.5'N, 103°41.8'W; Alpine South 7.5 minute quadrangle
Location: Outcrop in Ranger Canyon, approximately 5.5 km southwest of Alpine
Map Unit: Morrow tuff member of Duff Formation (Paisano volcano of Parker, 1983; Parker and McDowell, 1979); sample from Parker and McDowell (1979), who reported K-Ar and petrographic data
Description: Sparsely porphyritic rhyolitic ash-flow tuff,
Phenocrysts:
Alkali feldspar: 2% to 1 mm;
Clinopyroxene: <1% to 0.5 mm; mostly oxidized
Fayalite?: <1% to 0.5 mm; mostly altered to iddingsite
Magnetite: <1% to 0.2 mm
Groundmass
Welded, devitrified glass shards, abundant pumice, and minor trachyte lithic fragments

PP173 30° 16.7'N, 103°43.7'W; Alpine South 7.5 minute quadrangle
Location: Outcrop 1.6 km southwest of Ranger Peak, southwest part of quadrangle
Map Unit: McIntyre tuff member of Duff Formation (Paisano volcano of

Parker, 1983; Parker and McDowell, 1979); sample from Parker and McDowell (1979), who reported K-Ar and petrographic data

Description: Moderately porphyritic rhyolitic ash-flow tuff,
Phenocrysts:
Alkali feldspar: 7% to 3 mm; clear, unzoned, broken grains
Clinopyroxene: 1% to 0.5 mm; mostly oxidized to aggregate of iron oxides
Opaque: <1% to 0.2 mm
Groundmass
Flattened, devitrified glass shards, minor pumice, and lithic fragments

PP220 30° 20.6'N, 103°44.5'W; Alpine South 7.5 minute quadrangle

Location: Quarry next to Southern Pacific railroad, Toronto Creek, northwest part of quadrangle

Map Unit: Morrow tuff member of Duff Formation (Paisano volcano of Parker, 1983; Parker and McDowell, 1979); sample from Parker and McDowell (1979), who reported K-Ar and petrographic data

Description: Sparsely porphyritic rhyolitic ash-flow tuff,
Phenocrysts:
Alkali feldspar: 2% to 1 mm;
Clinopyroxene: <1% to 0.5 mm; mostly oxidized
Magnetite: <1% to 0.2 mm
Groundmass
Welded, devitrified glass shards, abundant pumice, and minor trachyte lithic fragments

H89-19 30° 49.6'N, 103°57.4'W; Little Aguja Mountain 7.5 minute quadrangle

Location: Outcrop on northeast flank of Forbidden Mountain, west-central part of quadrangle

Map Unit: Adobe Canyon Formation (McKalips and others, 1982)

Description: Rhyolitic lava flow, sample from upper vitrophyre
Phenocrysts:
Alkali feldspar: 8% to 5 mm as individual grains and glomerocrysts; clear, unzoned; some Carlsbad twins; glomerocrysts have clinopyroxene and apatite
Clinopyroxene: 1% to 1mm
Opaque: <1% to 0.2 mm, probably magnetite
Zircon: rare, euhedral
Apatite: <<1% to 0.1 mm
Groundmass
Glassy, flow-banded with scattered alkali feldspar microlites; perlitic cracks; incipient devitrification along flow bands

H89-37 30° 41.7'N, 103°53.5'W; Casket Mountain 7.5 minute quadrangle
Location: Outcrop in valley east-central part of quadrangle
Map Unit: Adobe Canyon Formation (McKalips and others, 1982)
Description: Rhyolitic lava flow: sample from upper vitrophyric breccia
Phenocrysts:
Alkali feldspar: 3% to 5 mm, as individual grains and glomerocrysts; clear, unzoned, some with Carlsbad twins, common microperthite
Clinopyroxene: 1 grain, 0.6 mm
Arfvedsonite: <1% to 0.2 mm
Zircon: <<1% to 0.08 mm
Apatite: <<1% to 0.16 mm
Aenigmatite(?): intergrown with arfvedsonite
Groundmass
Glassy (slight devitrification along flow bands) with swirling flow bands and rare vesicles

H89-175 30° 39.9'N, 104°01.6'W; Mount Locke 7.5 minute quadrangle
Location: Road cut along Highway 118 below McDonald Observatory
Map Unit: Previously mapped as Sheep Pasture Formation (Anderson, 1968; Twiss, 1979) but part of Adobe Canyon Formation (Henry and others, in prep.)
Description: Rhyolitic lava flow: sample from massive to moderately flow banded interior
Phenocrysts:
Alkali feldspar: 5% to 2-3 mm; clear, untwinned, unzoned
Clinopyroxene: <1% to 1 mm; mostly oxidized to aggregate of opaques
Groundmass
Intergrown alkali feldspar and quartz in "snowflake" texture with sparse opaques

H87-161 30° 32.2'N, 103°47.8'W; Fort Davis SE 7.5 minute quadrangle
Location: Road cut along Highway 118 southeast of Fort Davis
Map Unit: Limpia Formation (McKalips and others, 1982)
Description: Rhyolitic lava flow; clast from silicified upper breccia of flow
Phenocrysts:
Alkali feldspar (anorthoclase): 25% to 12 mm; suhedral, zoned, mottled extinction, commonly sieve textured, some grid twinned cores
Clinopyroxene: 3% to 2 mm; totally oxidzed to opaque aggregates
Zircon: <<1% to 0.05 mm

Groundmass
Partly glass matrix with microlites of alkali feldspar; partly spherulitic; abundant secondary silica

22-7 30° 39.1'N, 103°48.2'W; Swayback Mountain 7.5 minute quadrangle
Location: Road cut along Highway 17 12.6 km northeast of Fort Davis
Map Unit: Gomez Tuff (McKalips and others, 1982); sample from Parker and McDowell (1979), who reported K-Ar and petrographic data
Description: Peralkaline rhyolitic ash-flow tuff (Comendite), slight secondary flow foliation; generalized description from Parker and McDowell (1979)
Phenocrysts:
Alkali feldspar: 9%, mostly 1.5 mm; subhedral
Quartz: <1%, 1 to 3 mm
Aegirine-augite: <1% to 0.6 mm, commonly altered to opaque aggregates
Opaque: <1% to 0.3 mm
Fayalite: <1% to 0.5 mm, commonly idingsitized
Groundmass
Densely welded, axiolitically devitrified glass shards; minor pumice with spherulitic devitrification

G-7 31° 05.6'N, 104°05.6'W; Gomez Peak 7.5 minute quadrangle
Location: Outcrop in Spring Hills, north of Interstate Highway 10
Map Unit: Gomez Tuff (McKalips and others, 1982); sample from Parker and McDowell (1979), who reported K-Ar and petrographic data
Description: Peralkaline rhyolitic ash-flow tuff (Comendite); see 22-7 for generalized description

G-4 30° 51.2'N, 103°59.3'W; Little Aguja Mountain 7.5 minute quadrangle
Location: Landslide block along road into Madera Canyon
Map Unit: Gomez Tuff (McKalips and others, 1982); sample from Parker and McDowell (1979), who reported K-Ar and petrographic data
Description: Peralkaline rhyolitic ash-flow tuff (Comendite); see 22-7 for generalized description

G-3 30° 49.6'N, 103°48.8'W; Big Aguja Mountain 7.5 minute quadrangle
Location:
Map Unit: Gomez Tuff (McKalips and others, 1982); sample from Parker and McDowell (1979), who reported K-Ar and petrographic data
Description: Peralkaline rhyolitic ash-flow tuff (Comendite); see 22-7 for

generalized description

G-6 30° 58.4'N, 103°43.0'W; Balmorhea 7.5 minute quadrangle
Location: Outcrop along Balmorhea Lake road, 2.9 km south of intersection with Highway 290
Map Unit: Gomez Tuff (McKalips and others, 1982); sample from Parker and McDowell (1979), who reported K-Ar and petrographic data
Description: Peralkaline rhyolitic ash-flow tuff (Comendite); see 22-7 for generalized description

H87-154B 30° 39.1'N, 103°43.6'W; Major Peak 7.5 minute quadrangle
Location: Outcrop in southwest part of quadrangle
Map Unit: Gomez Tuff (McKalips and others, 1982)
Description: Peralkaline rhyolitic ash-flow tuff (Comendite); large pumice fragment,
Phenocrysts:
Alkali feldspar: 6% to 3 mm; clear, euhedral to broken grains, Carlsbad twins, unzoned, some microperthitic
Mafic (clinopyroxene?): 1% to 1mm; completely oxidized to opaque aggregates
Groundmass
Interlocking spherulites (alkali feldspar and quartz) in 0.5 mm spheres; moderately welded with some remaining porosity

H89-73 30° 31.4'N, 103°38.9'W; Henderson Mesa 7.5 minute quadrangle
Location: Outcrop on small mesa southwest of YO Peak in southeastern part of quadrangle
Map Unit: Gomez Tuff (McKalips and others, 1982)
Description: Peralkaline rhyolitic ash-flow tuff (Comendite), crystal-rich lens in thin distal tuff
Phenocrysts:
Alkali feldspar: 10%, 1 to 6 mm; clear, euhedral to broken, commonly resorbed embayments, Carlsbad twins, some slightly zoned
Quartz: 1% to 3 mm; resorbed
Clinopyroxene: 1% to 1 mm; completely altered to opaque aggregates
Opaque: <1% to 0.2 mm
Groundmass
Densely welded, axiolitically devitrified shards, spherulitically devitrified pumice, and sparse lithics of fine, silicic igneous rock

K-88-1 30° 53.3' N, 104° 0.6' W;
Location: Low hill at the mouth of Cherry Canyon, within Buckhorn

Caldera, stop 1D of Henry, et al. (1989).

Map unit: Cherry Canyon intrusion.

Description: Strongly peralkaline equigranular granophyric granite, no thin section available. Composed of fine grained microperthitic alkali feldspar, quartz, acmitic clinopyroxene, arfsvedsonite and aenigmatite.

H87-166 30° 53.2'N, 103°42.4'W; Balmorhea 7.5 minute quadrangle

Location: Outcrop on south flank of Saddleback Mountain, south-central part of quadrangle

Map Unit: Unnamed peralkaline rhyolite lava dome (Henry and others, in prep.)

Description: Peralkaline rhyolitic lava, flow banded, vesicular

Phenocrysts:

Alkali feldspar: 1%, 1 to 3 mm long laths; clear, euhedral, unzoned, Carlsbad twins

Arfvedsonite: <<1% to 0.5 mm

Quartz: <<1% to 0.5 mm

Groundmass

Trachytic alkali feldspar laths with interstitial quartz, poikilitic arfvedonsite, and minor acmite? and opaque

5-27-71 ~30° 41.0'N, ~103°47.1'W; Swayback Mountain 7.5 minute quadrangle

Location: Road cut along Highway 17 approximately 14.7 km northeast of Fort Davis

Map Unit: Star Mountain Formation (Gibbon, 1969; McKalips and others, 1982); Henry and others, in prep.); sample from Parker and McDowell (1979), who reported K-Ar and petrographic data

Description: Rhyolitic lava flow; massive, devitrified, faintly flow banded

Phenocrysts:

Alkali feldspar: 8%, 1-5 mm as individual grains and glomerocrysts; clear, unzoned, Carlsbad twins

Clinopyroxene: 1% to 1 mm; altered to opaque aggregates

Opaque (probably magnetite): <1% to 0.3 mm

Groundmass

Trachytic alkali feldspar laths with interstitial quartz

H87-155 30° '39.1N, 103°43.6'W; Major Peak 7.5 minute quadrangle

Location: Outcrop on flank of small mesa, southwestern part of quadrangle

Map Unit: Star Mountain Formation (Gibbon, 1969; McKalips and others, 1982; Henry and others, in prep.)

Description: Rhyolitic lava flow; devitrified sample from top of flow

Phenocrysts:

Alkali feldspar: 7%, 1 ato 6 mm; clear, euhedral, unzoned,

Carlsbad and fine grid twins
Clinopyroxene: altered to opaque aggregates
Opaque: <1% to 0.3 mm
Groundmass
Trachytic, extremely fine grained alkali feldspar and poikilitic quartz; abundant secondary quartz along shear planes

H87-157 30° '39.0N, 103°40.9'W; Swayback Mountain 7.5 minute quadrangle
Location: Outcrop in Horsethief Canyon, south-central part of quadrangle
Map Unit: Star Mountain Formation (Gibbon, 1969; McKalips and others, 1982)
Description: Rhyolitic lava flow; devitrified sample from middle of flow
Phenocrysts:
Alkali feldspar: 10%, 1 to 5 mm as individual grains and glomerocrysts; unzoned, Carlsbad twins, microperthitic
Clinopyroxne: <1% to 1 mm; altered to opaque aggregates
Fayalite: <1% to 1 mm: altered to serpentine, commonly as glomerocrysts with alkali feldspar
Groundmass
Fine alkali feldspar, some trachytic, enclosed by poikilitic quartz (snowflake texture); poikilitic arfvedsonite, mostly altered to iron oxides

H88-79 30° 56.3'N, 103°55.0'W; Antelope Flat 7.5 minute quadrangle
Location: Outcrop on south flank of Kingston Hills, east-central part of quadrangle
Map Unit: Star Mountain Formation (Gibbon, 1969; McKalips and others, 1982)
Description: Rhyolitic lava flow; devitrified sample from middle of flow
Phenocrysts:
Alkali feldspar: 10% to 4 mm as individual grains and glomerocrysts; clear, euhedral, unzoned, Carlsbad twins, some microperthitic
Clinopyroxene: 1% to 1 mm; altered to opaque aggregates
Opaque (probably both magnetite and ilmenite): <1% to 0.2 mm
Groundmass
Trachytic alkali feldspars enclosed by coarse poikilitic quartz, opaque, and poikilitic arfvedsonite?, altered to iron oxides

H88-71 30° 35.4'N, 103°34.9'W; Last Chance Mesa 7.5 minute quadrangle
Location: Outcrop at edge of cliff of Star Mountain Formation northwestern part of quadrangle
Map Unit: Star Mountain Formation (Gibbon, 1969; McKalips and others,

1982); Henry and others, in prep.)
Description: Rhyolitic lava flow; sample is from basal vitrophyre
Phenocrysts:
Alkali feldspar: 6% to 8 mm as individual grains and glomerocrysts; clear, euhedral, Carlsbad twins
Clinopyroxene: 2% to 0.5 mm, commonly as glomerocrysts with alkali feldspar
Fayalite: 1% to 0.5 mm; altered to serpentine
Magnetite and Ilmenite: <1% to 0.1 mm
Apatite: <<1% to 0.1 mm
Groundmass
Perlitic glass with dendritic clinopyroxene, alkali feldspar microlites, and a few opaque grains

H89-68 30° 48.4'N, 103°53.2'W; Little Aguja Mountain 7.5 minute quadrangle
Location: Road cut along Ranch Road 1832, east-central part of quadrangle
Map Unit: Laccolithic intrusion, probably a shallow body related to Star Mountain Formation (Gibbon, 1969; McKalips and others, 1982)
Description: Rhyolitic laccolith,
Phenocrysts:
Alkali feldspar: 8% to 5 mm as individual grains and glomerocrysts; possibly two types: (Sanidine, clear, unzoned, Carlsbad twins, microperthitic) and (Anorthoclase, slightly mottled and sieve textured)
Clinopyroxene: 1% to 0.5 mm; some as glomerocrysts with alkali feldspar
Fayalite: <1% to 1 mm: altered to serpentine
Opaque: <1% to 0.2 mm
Groundmass
Alkali feldspar laths, abundant clinopyroxene, interstitial quartz, poikilitic arfvedsonite, and altered, interstitial glass

H88-56 30° 04.1'N, 103°33.7'W; Elephant Mountain 7.5 minute quadrangle
Location: Outcrop in central part of quadrangle
Map Unit: Crossen Trachyte (Goldich and Elms, 1948; McAnulty, 1955; McKalips and others, 1982)
Description: Quartz trachyte lava flow
Phenocrysts:
Alkali feldspar (anorthoclase): 5% to 3 mm as individual grains and to 5 mm as glomerocrysts; common grid twins
Clinopyroxene: 1% to 0.5 mm
Magnetite: <1% to 0.5 mm
Apatite: <<1% to 0.2 mm

Groundmass
alkali feldspar laths, very minor quartz, clinopyroxene?, and opaque; some calcite alteration

H87-168 30° 00.1'N, 103°36.2'W; Elephant Mountain 7.5 minute quadrangle
Location: Outcrop in canyon within Crossen Mesa, southwestern part of quadrangle
Map Unit: Crossen Trachyte (type locality of Goldich and Elms, 1948; McAnulty, 1955; McKalips and others, 1982)
Description: Rhyolitic lava flow; vitophyre
Alkali feldspar: 10% to 10 mm, as individual euhedral grains and glomerocrysts; rare Carlsbad twins; slightly zoned
Clinopyroxene: 1-2% to 2 mm, as individual grains and in glomerocrysts with alkali feldspar
Fayalite: 1% to 1 mm
Magnetite: <1% to 0.5 mm
Ilmenite: <<1% to 0.3 mm
Apatite: <<1% to 0.1 mm
Groundmass
Mostly glass with dendritic clinopyroxene and alkali feldspar laths

H87-205 30° 32.9'N, 104°40.4'W; Vieja Pass 7.5 minute quadrangle
Location: Outcrop in canyon east of Vieja Pass, central part of quadrangle
Map Unit: Bracks Rhyolite (Twiss, 1979; Henry and others, 1990)
Description: Rhyolitic lava flow: sample from vitrophyric dome in otherwise crystalline or devitrified massive interior (see Henry and others, 1990 for further description)
Phenocrysts:
Alkali feldspar (Or34-40): 8-10% to 10 mm, as individual euhedral grains and glomerocrysts; rare Carlsbad twins; slightly zoned
Clinopyroxene: 1-2% to 2 mm, as individual grains and in glomerocrysts with alkali feldspar
Fayalite: 1% to 1 mm
Magnetite: <1% to 0.3 mm
Apatite: <<1% to 0.1 mm
Groundmass
Mostly glass with dendritic clinopyroxene and alkali feldspar laths

H89-177 30° 23.1'N, 104°40.2'W; Gettysburg Peak 7.5 minute quadrangle
Location: Outcrop on mesa south of Cold Water Canyon, south-central part of quadrangle

Map Unit: Bracks Rhyolite (Twiss, 1979; Henry and others, 1990)
Description: Rhyolitic lava flow: sample from vitrophyric dome

Phenocrysts:

Alkali feldspar (Or34-40): 8-10% to 10 mm, as individual euhedral grains and glomerocrysts; rare Carlsbad twins; slightly zoned

Clinopyroxene: 1-2% to 2 mm, as individual grains and in glomerocrysts with alkali feldspar

Fayalite: 1% to 1 mm

Magnetite: <1% to 0.3 mm

Groundmass

Mostly glass with dendritic clinopyroxene and alkali feldspar laths

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.

The first of these formats is a condensed tabular form (Table 1). The data presented in this table are organized by site number. 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 one to three graphical representations of some of the age spectrum data.

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. 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. For one sample a preferred age is indicated (H87-155). The steps in this preferred age meet all of the plateau criteria, except they includes only 48.7% of the total ^{39}Ar released. All precision estimates, in all tables, are at the one sigma level of confidence.

The figure with each age spectrum data set 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.

For the amphibole sample 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. The amphibole, plagioclase and one alkali feldspar (H87-177) 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, an age can be directly calculated from this value. The Y-axis intercept is the inverse of the apparent initial $^{40}Ar/^{36}Ar$ ratio of the sample. 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 Davis Mountains, Trans-Pecos volcanic field. All samples are alkali feldspar, except H89-174 (calcic anorthoclase), H89-158B (plagioclase), and K-88-1 (arfvedsonite).

SAMPLE	AGE (Ma)	%^{39}Ar	STEPS TOTAL	MSWD	^{40}Ar/^{36}Ar	COMMENT
			Musquiz Canyon			
H88-87	32.84 ± 0.12	68.5	6/8		Atmos.	Plateau
BD-1	32.78 ± 0.11	84.4	6/7		Atmos.	Plateau
			Mitre Peak area			
Gor 2A	34.57 ± 0.12	67.5	5/8		Atmos.	Plateau
			Lavas of Casket Mountain			
H89-8	35.07 ± 0.12	100	9/9		Atmos.	Plateau
H89-153	35.09 ± 0.12	79.6	5/8		Atmos.	Plateau
H89-12	35.29 ± 0.12	100	8/8		Atmos.	Plateau
H89-47	35.27 ± 0.12	56.2	2/6		Atmos.	Plateau
GKR-1	35.35 ± 0.12	100	8/8		Atmos.	Plateau
			Wild Cherry Tuff			
J87-41	35.29 ± 0.12	75.8	5/8		Atmos.	Plateau
J87-44	35.33 ± 0.12	67.1	4/8		Atmos.	Plateau
H89-151	34.96 ± 0.12	80.4	4/6		Atmos.	Plateau
H89-143	35.32 ± 0.12	100	3/3		Atmos.	Plateau
BS-3	35.44 ± 0.12	98.3	7/8		Atmos.	Plateau
			Mount Locke Formationn			
H89-174	35.00 ± 0.12	51.1	4/9		Atmos.	Plateau
			Mount Locke Formation lateral equivalents			
H8-158B		100	8/8		Atmos.	Disturbed
			Barrel Springs Formation			
H89-173	35.54 ± 0.12	51.1	5/8		Atmos.	Plateau
BS-4	35.48 ± 0.12	59.8	6/9		Atmos.	Plateau
J87-67	35.69 ± 0.12	50.6	6/8		Atmos.	Plateau
BS-1	35.67 ± 0.12	55.0	7/8		Atmos.	Plateau
J87-65	35.65 ± 0.12	100	7/7		Atmos.	Plateau
	36.50 ± 0.12	86.7	6/7		Atmos.	Plateau
	36.65 ± 0.12	100	7/7		Atmos.	Plateau

TABLE 1. (cont.) Summary of argon isotopic results from the Davis Mountains, Trans-Pecos volcanic field. All samples are alkali feldspar, except H89-174 (calcic anorthoclase), H89-158B (plagioclase), and K-88-1 (arfvedsonite).

SAMPLE	AGE (Ma)	%^{39}Ar	STEPS TOTAL	MSWD	^{40}Ar/^{36}Ar	COMMENT
			"Sheep Pasture Formation"			
H89-23	<35.9	13.1	1/7		Atmos.	Minimum
			Sleeping Lion Formation			
21-9	35.96 ± 0.13	71.5	4/7		Atmos.	Plateau
J87-62	35.90 ± 0.13	60.4	4/7		Atmos.	Plateau
	35.86 ± 0.13	87.2	7/8		Atmos.	Plateau
			"Moore Tuff"			
85210	36.02 ± 0.13	100	7/7		Atmos.	Plateau
			Paisano Volcano			
PP37	36.22 ± 0.13	100	8/8		Atmos.	Plateau
PP173	36.31 ± 0.13	76.4	4/7		Atmos.	Plateau
PP220	36.47 ± 0.13	65.1	6/7		Atmos.	Plateau
			Adobe Canyon Formation			
H89-19	36.49 ± 0.13	76.3	6/7		Atmos.	Plateau
H89-37	36.57 ± 0.13	92.9	7/8		Atmos.	Plateau
H89-175	36.47 ± 0.13	86.8	6/8		Atmos.	Plateau
			Limpia Formation			
H87-161	36.46 ± 0.13	88.1	5/6		Atmos.	Plateau
			Gomez Tuff			
22-7	36.75 ± 0.13	90.7	6/7		Atmos.	Plateau
G-7	36.77 ± 0.13	57.3	6/8		Atmos.	Plateau
G-4	36.85 ± 0.12	91.9	6/7		Atmos.	Plateau
G-3	36.73 ± 0.13	81.6	5/7		Atmos.	Plateau
G-6	<37.29	45.4	1/7		Atmos.	Climbing spectrum
H87	36.69 ± 0.13	86.3	7/8		Atmos.	Plateau
H89-73	36.66 ± 0.13	92.0	7/8		Atmos.	Plateau
			Cherry Canyon			
K-88-1	36.91 ± 0.13	100	7/7		Atmos.	Plateau
	36.89 ± 0.13	100	7/7		303, 46	Isochron
			rhyolite lava dome			
H87-166	36.87 ± 0.13	67.2	5/7		Atmos.	Plateau

TABLE 1. (cont.) Summary of argon isotopic results from the Davis Mountains, Trans-Pecos volcanic field. All samples are alkali feldspar, except H89-174 (calcic anorthoclase), H89-158B (plagioclase), and K-88-1 (arfvedsonite).

SAMPLE	AGE (Ma)	%^{39}Ar	STEPS TOTAL	MSWD	^{40}Ar/^{36}Ar	COMMENT
			Star Mountain Formation			
5-27-71	36.84 ± 0.13	84.5	5/8		Atmos.	Pataeu
	36.79 ± 0.13	100	6/6		Atmos.	Plateau
H87-155	36.86 ± 0.13	48.7	6/8		Atmos.	Preferred age
H87-157	36.81 ± 0.13	76.9	7/8		Atmos.	Plateau
H88-79	36.94 ± 0.13	53.9	2/4		Atmos.	Plateau
	36.94	100	8/8		Atmos.	Total gas
H88-71	36.74 ± 0.13	100	8/8		Atmos.	Plateau
H89-68	36.9 ± 0.13	82.5	4/6		Atmos.	Plateau
			Crossen Trachyte			
H88-56	37.2 ± 0.13	70.8	3/6		Atmos.	Plateau
H87-168	36.77 ± 0.13	100	8/8		Atmos.	Plateau
			Bracks Rhyolite			
H87-205	36.73 ± 0.13	100	8/8		Atmos.	Plateau
H89-177	36.69 ± 0.13	100	7/7	1.67	293 ± 3	Isochron

R A W D A T A

FILE	TEMP	40Ar	39Ar	38Ar	37Ar	36Ar regression	TRAP CURRENT	MANIFOLD OPTION
24533	980	1181865	303253	4311	2712	74	200	EALL
	+	273	245	6	17	4		
24534	1080	1496159	390153	5140	3452	19	200	EALL
	+	849	195	28	18	6		
24535	1180	1011522	263571	3526	2349	22	200	EALL
	+	488	156	14	8	9		
24536	1230	486932	126532	1688	1120	9	200	EALL
	+	322	124	8	8	9		
24537	1270	457926	118994	1589	1048	12	200	EALL
	+	354	29	13	13	13		
24538	1300	519785	134876	1779	1170	15	200	EALL
	+	267	96	4	8	10		
24539	1400	2117802	549470	7229	4720	24	200	EALL
	+	455	349	13	6	2		
24540	1650	265370	66684	827	579	27	200	EALL
	+	134	11	23	15	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
980	50	1635	1725	4070	0	3	0	1	0	14
1080	65	2083	2220	5236	0	4	0	1	-0	3
1180	44	1419	1499	3537	0	3	0	1	0	4
1230	21	677	720	1698	0	1	0	0	-0	2
1270	20	634	677	1597	0	1	0	0	-0	2
1300	22	708	767	1810	0	1	0	0	-0	3
1400	91	2862	3126	7375	0	5	0	2	-0	4
1650	11	352	379	895	0	1	0	0	-0	5

All values in counts, corrected for mass discrimination

v 02/05/91 H88-87 15:26:00 7 Feb 1992 RD 73

TEMP C	% TOT 39Ar	RAD YIELD	APP K/Ca	APP K/Cl	F	AGE (Ma)	precision intra-sample	precision intra-package	precision inter-packag
A 980	15.5	98.2	36.18	2751	3.814	32.87 +	.04	.09	.19
B 1080	20.0	99.6	36.55	0	3.809	32.82 +	.04	.09	.19
C 1180	13.5	99.4	36.27	307687	3.803	32.76 +	.08	.12	.20
D 1230	6.5	99.5	36.52	0	3.817	32.89 +	.18	.20	.26
E 1270	6.1	99.2	36.67	0	3.806	32.80 +	.27	.28	.33
F 1300	6.9	99.1	37.24	0	3.809	32.82 +	.18	.20	.26
G 1400	28.1	99.7	37.58	0	3.831	33.00 +	.01	.08	.19
H 1650	3.4	97.0	37.16	0	3.848	33.15 +	.26	.27	.32

Total gas K/Ca = 36.8

Precisions are 1 sigma, measured in Ma. Measured 40/36 atm = 297.2 +.5
J = 0.004820 + 0.25% (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

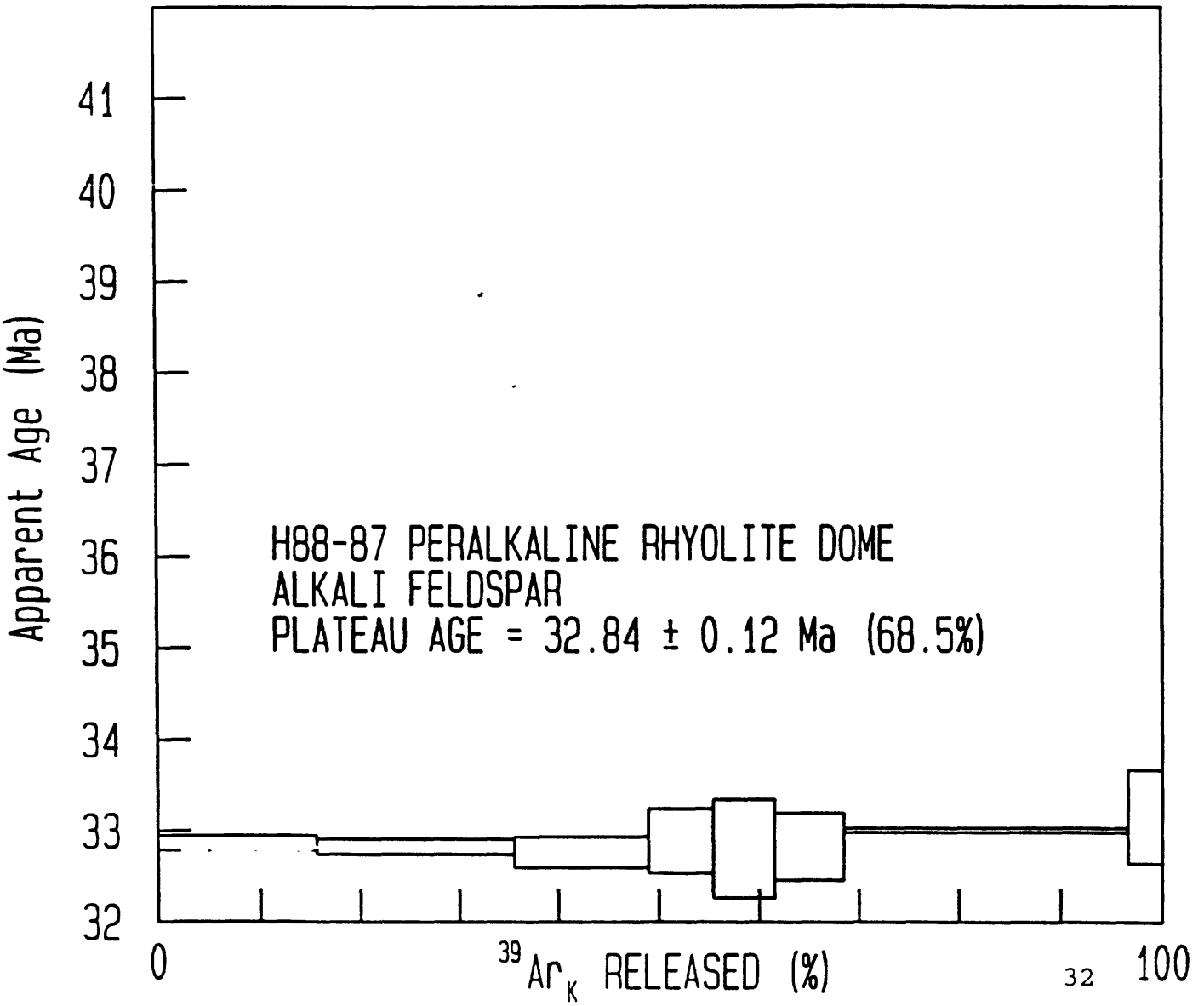
J = 0.004820 + 0.25% SAMPLE WT = 0.5010 g

TEMP C	Initial & radiogenic 40Ar	Potassium derived 39Ar	Chlorine derived 38Ar	Calcium derived 37Ar	Initial 36Ar	AGE* in Ma	**
980	2.360E-11	6.075E-12	5.343E-15	8.730E-14	1.458E-15	32.87 +	.04
1080	2.988E-11	7.815E-12	***	1.112E-13	***	32.82 +	.04
1180	2.020E-11	5.280E-12	***	7.569E-14	***	32.76 +	.08
1230	9.724E-12	2.535E-12	***	3.609E-14	***	32.89 +	.18
1270	9.145E-12	2.384E-12	***	3.380E-14	***	32.80 +	.27
1300	1.038E-11	2.702E-12	***	3.772E-14	***	32.82 +	.18
1400	4.229E-11	1.101E-11	***	1.523E-13	***	33.00 +	.01
1650	5.300E-12	1.336E-12	***	1.869E-14	***	33.15 +	.26
TOTAL GAS	1.505E-10	3.913E-11	5.385E-15	5.528E-13	3.931E-15	32.89	

68.5% of gas on plateau, steps 980 through 1300 PLATEAU AGE = 32.84 ± .13
51.0% of gas on plateau, steps 1230 through 1650 PLATEAU AGE = 33.00 ± .13

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 02/05/91


41
40
39
38
37
36
35
34
33
32
Apparent Age (Ma)
H88-87 PERALKALINE RHYOLITE DOME
ALKALI FELDSPAR
PLATEAU AGE = 32.84 ± 0.12 Ma (68.5%)
0
$^{39}Ar_K$ RELEASED (%)
100

v 06/13/92 BD-1 #127 RD93 19:36:46 19 Feb 1993

R A W D A T A

FILE	TEMP	40Ar	39Ar	38Ar	37Ar	36Ar	TRAP CURRENT	MANIFOLD OPTION
					ä	*		
35272	960	256637	102574	1323	488	13	200	EALL
	▪	103	44	7	9	5		
35273	1050	63265	25033	350	132	14	200	EALL
	▪	8	23	11	14	10		
35274	1100	69340	27529	382	155	7	200	EALL
	▪	50	31	9	14	4		
35275	1150	262040	106871	1405	564	15	200	EALL
	▪	70	62	18	14	6		
35276	1200	927923	378873	4885	1857	16	200	EALL
	▪	424	552	8	13	6		
35277	1230	524172	212450	2706	989	11	200	EALL
	▪	317	183	7	9	8		
35278	1300	86637	34461	422	161	4	200	EALL
	▪	43	32	9	9	5		

* 36Ar peak values less than 10 are means those above 10 are from linear regressions

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
960	21	376	584	1377	0	1	0	0	-0	2
1050	5	102	142	336	0	0	0	0	0	3
1100	6	120	157	370	0	0	0	0	0	1
1150	21	436	608	1435	0	1	0	0	-0	3
1200	76	1437	2156	5086	0	2	0	1	-0	3
1230	43	766	1209	2852	0	1	0	0	-0	2
1300	7	124	196	463	0	0	0	0	-0	1

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	960	11.6	98.5	61.56	0	2.455	33.13	▪	.20	.22	.28
B	1050	2.8	93.5	55.46	3383	2.353	31.77	▪	1.63	1.63	1.64
C	1100	3.1	97.0	51.92	4541	2.434	32.86	▪	.52	.53	.55
D	1150	12.0	98.4	55.42	0	2.402	32.43	▪	.24	.25	.30
E	1200	42.7	99.5	59.63	0	2.427	32.77	▪	.07	.11	.20
F	1230	23.9	99.4	62.75	0	2.442	32.96	▪	.15	.17	.24
G	1300	3.9	98.8	62.70	0	2.474	33.39	▪	.57	.57	.60

Total gas K/Ca = 59.9

Precisions are 1 sigma, measured in Ma. Measured 40/36 atm = 297.3 ▪.5
J = 0.007551 ▪ 0.25% (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: 2.07 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

v 06/13/92 19:36:50 19 Feb 1993

BD-1 #127 RD93

J = 0.007551 ▪ 0.25% SAMPLE WT = 0.2516 g

TEMP C	Initial & radiogenic 40Ar	Potassium derived 39Ar	Chlorine derived 38Ar	Calcium derived 37Ar	Initial 36Ar	AGE* in Ma	**
960	7.818E-12	3.137E-12	***	2.650E-14	***	33.13 ▪	.20
1050	1.927E-12	7.656E-13	***	7.178E-15	***	31.77 ▪	1.63
1100	2.112E-12	8.420E-13	***	8.433E-15	***	32.86 ▪	.52
1150	7.982E-12	3.269E-12	***	3.067E-14	***	32.43 ▪	.24
1200	2.827E-11	1.159E-11	***	1.010E-13	***	32.77 ▪	.07
1230	1.597E-11	6.498E-12	***	5.385E-14	***	32.96 ▪	.15
1300	2.639E-12	1.054E-12	***	8.741E-15	***	33.39 ▪	.57
TOTAL GAS	6.671E-11	2.715E-11	***	2.364E-13	2.377E-15	32.82	

88.4% of gas on plateau, steps 1050 through 1300 PLATEAU AGE = 32.78 + .11

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

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

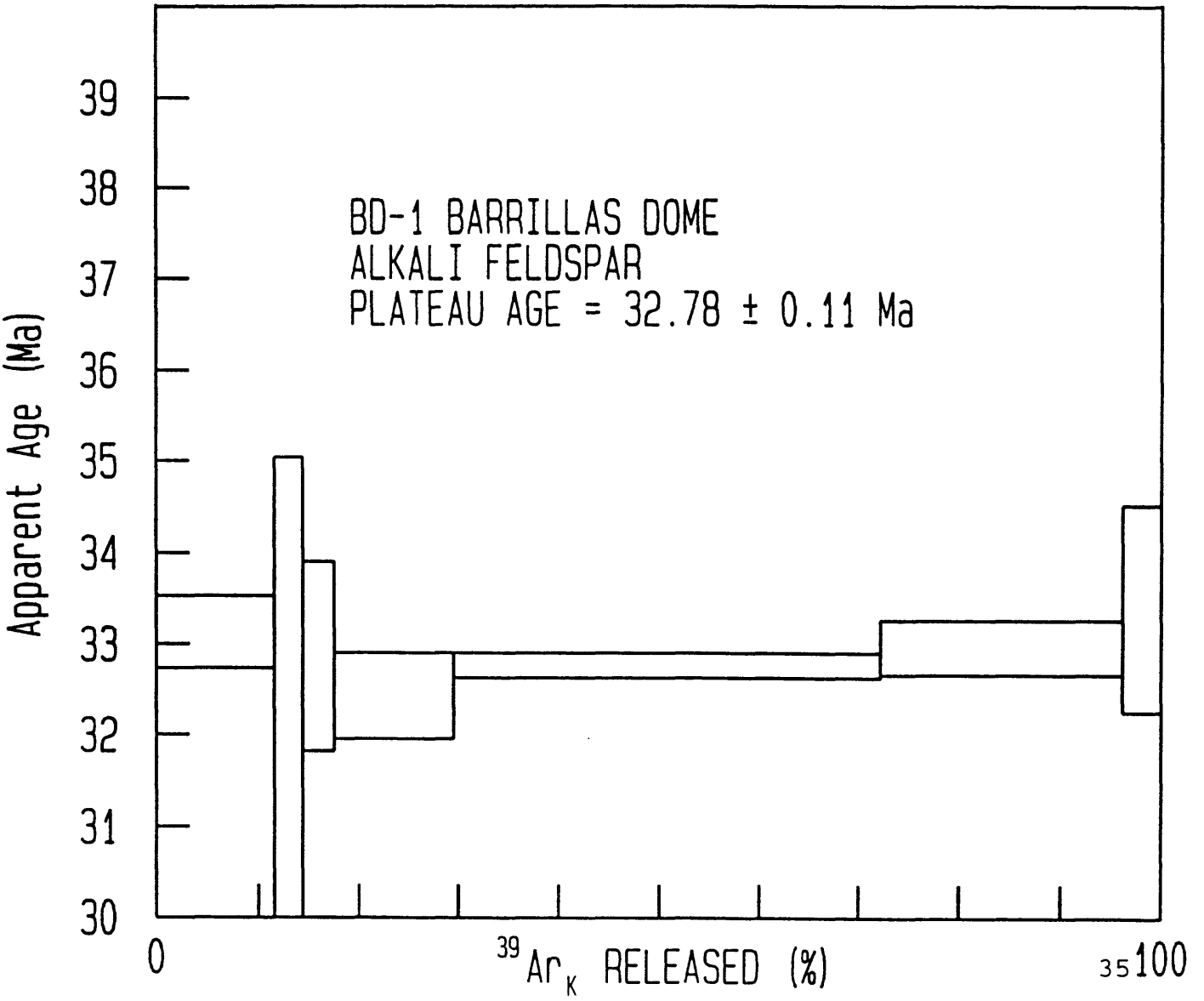
** 1-sigma precision estimates are for intra-sample reproducibility.

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

*** below detection limit

v 06/13/92

v 06/13/92 19:38:24 19 Feb 1993 BD-1 #127 RD93



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

R A W D A T A

FILE	TEMP	40Ar	39Ar	38Ar	37Ar	36Ar	TRAP CURRENT	MANIFOLD OPTION
					ä	*		
35283	960	723082	268207	3459	4713	74	200	EALL
	▪	208	226	14	12	5		
35284	1050	384479	145732	1870	2390	25	200	EALL
	▪	153	105	9	14	5		
35285	1100	186793	70321	910	1112	11	200	EALL
	▪	73	39	15	12	4		
35286	1150	205309	77964	997	1278	21	200	EALL
	▪	152	79	12	6	10		
35287	1200	503568	192239	2452	3209	16	200	EALL
	▪	206	131	13	7	4		
35288	1230	379669	144104	1844	2373	14	200	EALL
	▪	249	132	4	15	7		
35289	1300	140336	52900	653	824	4	200	EALL
	▪	220	84	15	3	3		
35290	1450	20873	7373	57	117	7	200	EALL
	▪	48	13	19	6	3		

* 36Ar peak values less than 10 are means those above 10 are from linear regressions

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
960	54	3678	1526	3600	0	6	0	2	-0	13
1050	30	1866	829	1956	0	3	0	1	-0	4
1100	14	869	400	944	0	1	0	1	-0	2
1150	16	1000	444	1047	0	2	0	1	-0	4
1200	39	2512	1094	2580	0	4	0	2	-0	3
1230	29	1859	820	1934	0	3	0	1	-0	2
1300	11	646	301	710	0	1	0	0	-0	1
1450	1	92	42	99	0	0	0	0	-0	1

All values in counts, corrected for mass discrimination

v 06/13/92 GOR 2A ALKALI FELDSPAR #125RD93 18:12:47 19 Feb 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	960	28.0	97.1	16.57	0	2.607	34.83 ▪	.07	.12	.21
B	1050	15.2	98.2	17.76	0	2.580	34.47 ▪	.14	.17	.24
C	1100	7.3	98.4	18.41	0	2.603	34.78 ▪	.20	.22	.29
D	1150	8.1	97.0	17.74	0	2.544	34.00 ▪	.50	.51	.54
E	1200	20.0	99.1	17.43	0	2.586	34.56 ▪	.09	.13	.22
F	1230	15.0	99.0	17.66	0	2.599	34.73 ▪	.20	.22	.28
G	1300	5.5	99.2	18.66	0	2.622	35.03 ▪	.24	.26	.32
H	1450	.8	90.4	18.28	0	2.551	34.09 ▪	1.42	1.42	1.43

Total gas K/Ca = 17.4

Precisions are 1 sigma, measured in Ma. Measured 40/36 atm = 297.3 ▪.5
J = 0.007479 ▪ 0.25% (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: 2.07 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

v 06/13/92 18:13:48 19 Feb 1993
GOR 2A ALKALI FELDSPAR #125RD93

J = 0.007479 ▪ 0.25% SAMPLE WT = 0.2506 g

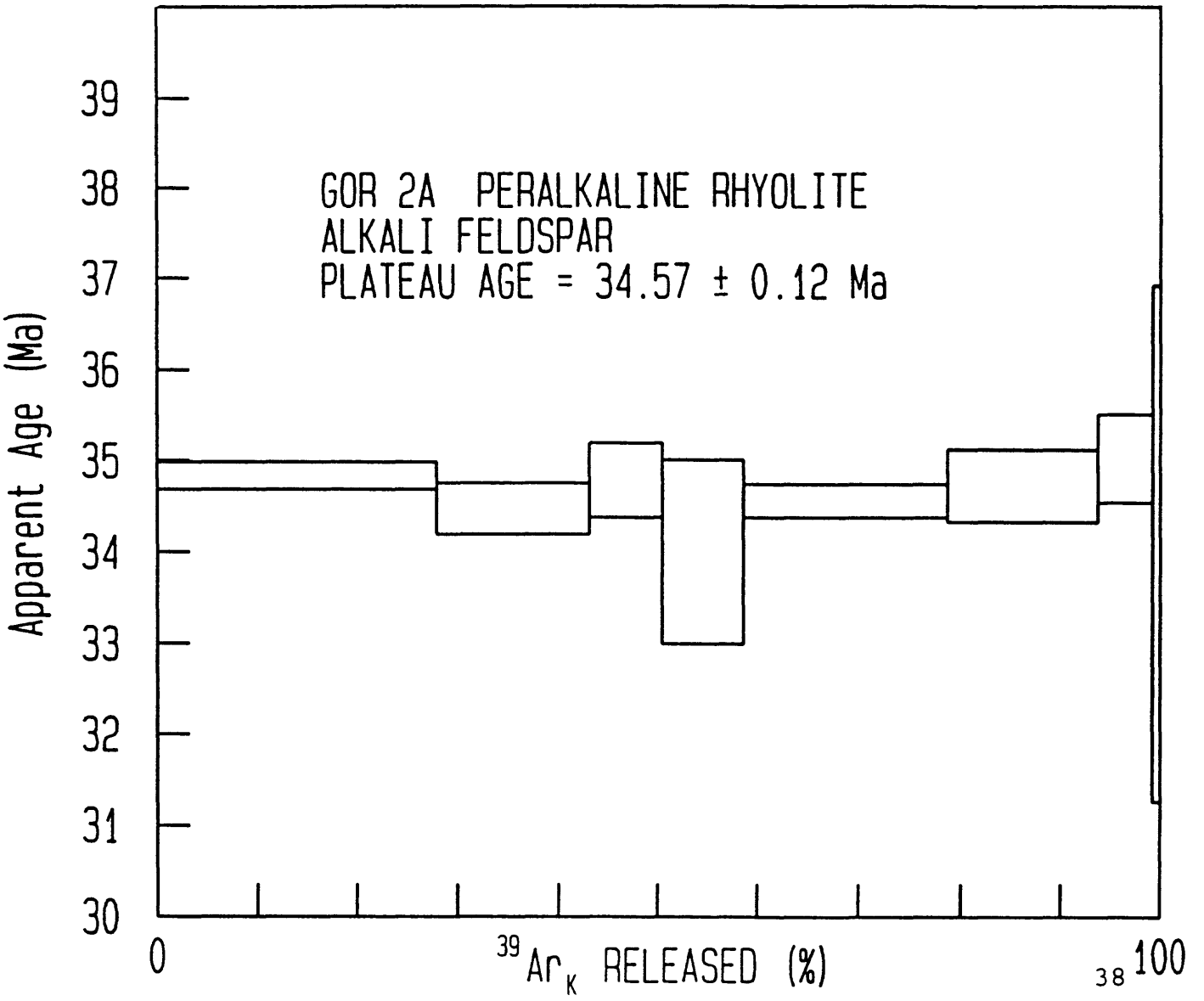
TEMP C	Initial & radiogenic 40Ar	Potassium derived 39Ar	Chlorine derived 38Ar	Calcium derived 37Ar	Initial 36Ar	AGE* in Ma	**
960	2.203E-11	8.203E-12	***	2.574E-13	2.191E-15	34.83 ▪	.07
1050	1.171E-11	4.457E-12	***	1.305E-13	***	34.47 ▪	.14
1100	5.691E-12	2.151E-12	***	6.075E-14	***	34.78 ▪	.20
1150	6.255E-12	2.384E-12	***	6.988E-14	***	34.00 ▪	.50
1200	1.534E-11	5.880E-12	***	1.755E-13	***	34.56 ▪	.09
1230	1.157E-11	4.407E-12	***	1.298E-13	***	34.73 ▪	.20
1300	4.276E-12	1.618E-12	***	4.509E-14	***	35.03 ▪	.24
1450	6.360E-13	2.255E-13	***	6.414E-15	***	34.09 ▪	1.42
TOTAL GAS	7.751E-11	2.933E-11	***	8.753E-13	5.040E-15	34.64	

65.7% of gas on plateau, steps 1050 through 1230 PLATEAU AGE = 34.57 + .12
56.8% of gas on plateau, steps 1100 through 1450 PLATEAU AGE = 34.64 + .12

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 18:27:13 19 Feb 1993 GOR 2A ALKALI FELDSPAR #125RD93



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

R A W D A T A

FILE	TEMP	40Ar	39Ar	38Ar	37Ar	36Ar regression	TRAP CURRENT	MANIFOLD OPTION
24483	950	412624	96734	1319	2531	66	200	EALL
	+	115	40	14	12	5		
24484	1050	816390	199011	2619	5111	17	200	EALL
	+	288	88	15	8	4		
24485	1100	835930	204222	2683	5152	18	200	EALL
	+	302	79	15	12	5		
24486	1130	760869	186272	2455	4617	6	200	EALL
	+	385	158	8	4	2		
24487	1180	822668	201282	2651	4968	12	200	EALL
	+	340	102	9	13	8		
24488	1230	788610	192686	2549	4702	3	200	EALL
	+	426	110	5	9	4		
24489	1330	1257689	307329	4063	7376	11	200	EALL
	+	644	126	14	11	5		
24490	1650	1744760	421501	5641	9835	70	200	EALL
	+	701	98	12	22	3		
24491	1650	213247	48928	620	1141	43	200	EALL
	+	52	28	11	14	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
950	15	1438	550	1298	0	3	0	1	0	12
1050	31	2907	1132	2671	0	5	0	2	-0	3
1100	32	2934	1162	2741	0	5	0	2	-0	3
1130	29	2631	1060	2500	0	5	0	2	-0	1
1180	32	2834	1145	2701	0	5	0	2	-0	2
1230	30	2685	1096	2586	0	5	0	2	-0	0
1330	49	4216	1748	4125	0	8	0	3	-0	1
1650	67	5627	2398	5657	0	10	0	4	0	12
1650	8	654	278	657	0	1	0	0	-0	8

All values in counts, corrected for mass discrimination

v 02/05/91 H89-8 14:58:41 7 Feb 1992

TEMP C	% TOT 39Ar	RAD YIELD	APP K/Ca	APP K/Cl	F	AGE (Ma)	precision intra-sample	precision intra-package	precision inter-packag
A 950	5.2	95.3	12.64	6336	4.053	34.91 +	.13	.16	.24
B 1050	10.7	99.5	12.87	0	4.068	35.03 +	.06	.10	.21
C 1100	11.0	99.4	13.10	0	4.058	34.95 +	.06	.10	.21
D 1130	10.0	99.8	13.33	0	4.066	35.01 +	.04	.10	.20
E 1180	10.8	99.6	13.38	0	4.060	34.97 +	.10	.13	.22
F 1230	10.4	100.0	13.53	0	4.080	35.13 +	.05	.10	.20
G 1330	16.5	99.8	13.75	0	4.073	35.07 +	.05	.10	.20
H 1650	22.7	98.9	14.14	83233	4.081	35.14 +	.02	.09	.20
I 1650	2.6	94.1	14.13	0	4.089	35.21 +	.30	.31	.36
Total gas K/Ca =			13.5						

Precisions are 1 sigma, measured in Ma. Measured 40/36 atm = 297.2 +.5
J = 0.004820 + 0.25% (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

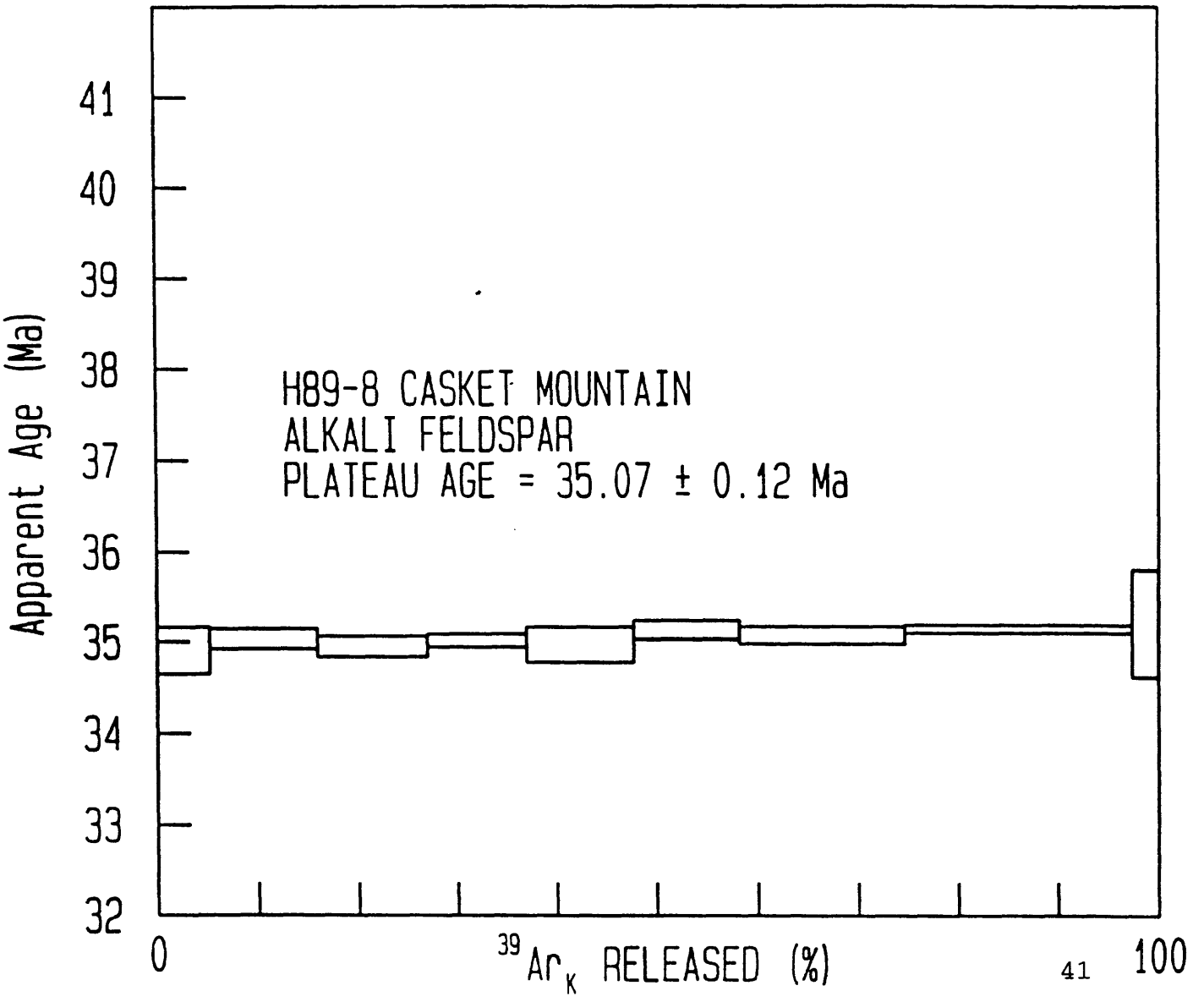
J = 0.004820 + 0.25% SAMPLE WT = 0.5013 g

TEMP C	Initial & radiogenic 40Ar	Potassium derived 39Ar	Chlorine derived 38Ar	Calcium derived 37Ar	Initial 36Ar	AGE* in Ma	**
950	8.241E-12	1.938E-12	***	7.972E-14	1.310E-15	34.91 +	.13
1050	1.631E-11	3.986E-12	***	1.611E-13	***	35.03 +	.06
1100	1.670E-11	4.091E-12	***	1.624E-13	***	34.95 +	.06
1130	1.520E-11	3.731E-12	***	1.456E-13	***	35.01 +	.04
1180	1.643E-11	4.032E-12	***	1.567E-13	***	34.97 +	.10
1230	1.575E-11	3.860E-12	***	1.484E-13	***	35.13 +	.05
1330	2.512E-11	6.156E-12	***	2.328E-13	***	35.07 +	.05
1650	3.485E-11	8.443E-12	***	3.106E-13	1.318E-15	35.14 +	.02
1650	4.259E-12	9.801E-13	***	3.606E-14	8.524E-16	35.21 +	.30
TOTAL GAS	1.528E-10	3.722E-11	9.856E-16	1.433E-12	4.543E-15	35.05	

100.0% of gas on plateau, steps 950 through 1650 PLATEAU AGE = 35.07 + .1

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 02/05/91 15:00:33 7 Feb 1992 H89-8 2072



v 02/05/91 (40/36in = 295.5)

v 02/05/91 H89-153 16:02:40 7 Feb 1992

R A W D A T A

FILE	TEMP	40Ar	39Ar	38Ar	37Ar	36Ar regression	TRAP CURRENT	MANIFOLD OPTION
24595	970	185886	36327	511	446	116	200	EALL
	+	94	28	7	14	6		
24596	1100	718625	172936	2287	2082	48	200	EALL
	+	436	132	13	9	5		
24597	1170	4020053	975939	12855	11355	91	200	EALL
	+	3665	507	25	3	11		
24607	1240	161890	37685	463	404	31	200	EALL
	+	80	34	18	11	5		
24608	1300	850222	205592	2704	2327	27	200	EALL
	+	494	133	19	6	4		
24609	1350	1221391	295142	3901	3261	40	200	EALL
	+	398	78	15	10	4		
24610	1400	1287060	310261	4073	3338	43	200	EALL
	+	1167	207	26	11	8		
24611	1650	385088	86703	1072	915	93	200	EALL
	+	78	84	16	10	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
970	7	341	207	488	0	1	0	0	0	22
1100	35	1593	984	2321	0	2	0	1	-0	9
1170	197	8712	5552	13099	0	14	1	5	-0	16
1240	8	318	214	506	0	0	0	0	-0	6
1300	42	1834	1170	2759	0	3	0	1	-0	5
1350	61	2573	1679	3961	0	4	0	2	-0	7
1400	64	2636	1765	4164	0	4	0	2	-0	8
1650	18	723	493	1164	0	1	0	0	-0	17

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-packag
A 970	1.7	81.5	23.94	1869	4.158	35.73 +	.39	.40	.44
B 1100	8.2	98.0	24.40	0	4.062	34.92 +	.08	.12	.21
C 1170	46.0	99.4	25.22	0	4.081	35.08 +	.04	.10	.20
D 1240	1.8	94.2	27.04	0	4.037	34.71 +	.32	.34	.38
E 1300	9.7	99.1	25.62	0	4.085	35.12 +	.05	.10	.21
F 1350	13.9	99.1	26.24	0	4.088	35.14 +	.04	.10	.20
G 1400	14.6	99.0	26.93	0	4.096	35.21 +	.07	.11	.21
H 1650	4.1	92.9	27.45	0	4.113	35.36 +	.20	.22	.28
Total gas K/Ca =			25.7						

Precisions are 1 sigma, measured in Ma. Measured 40/36 atm = 297.2 +.5
J = 0.004812 + 0.25% (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

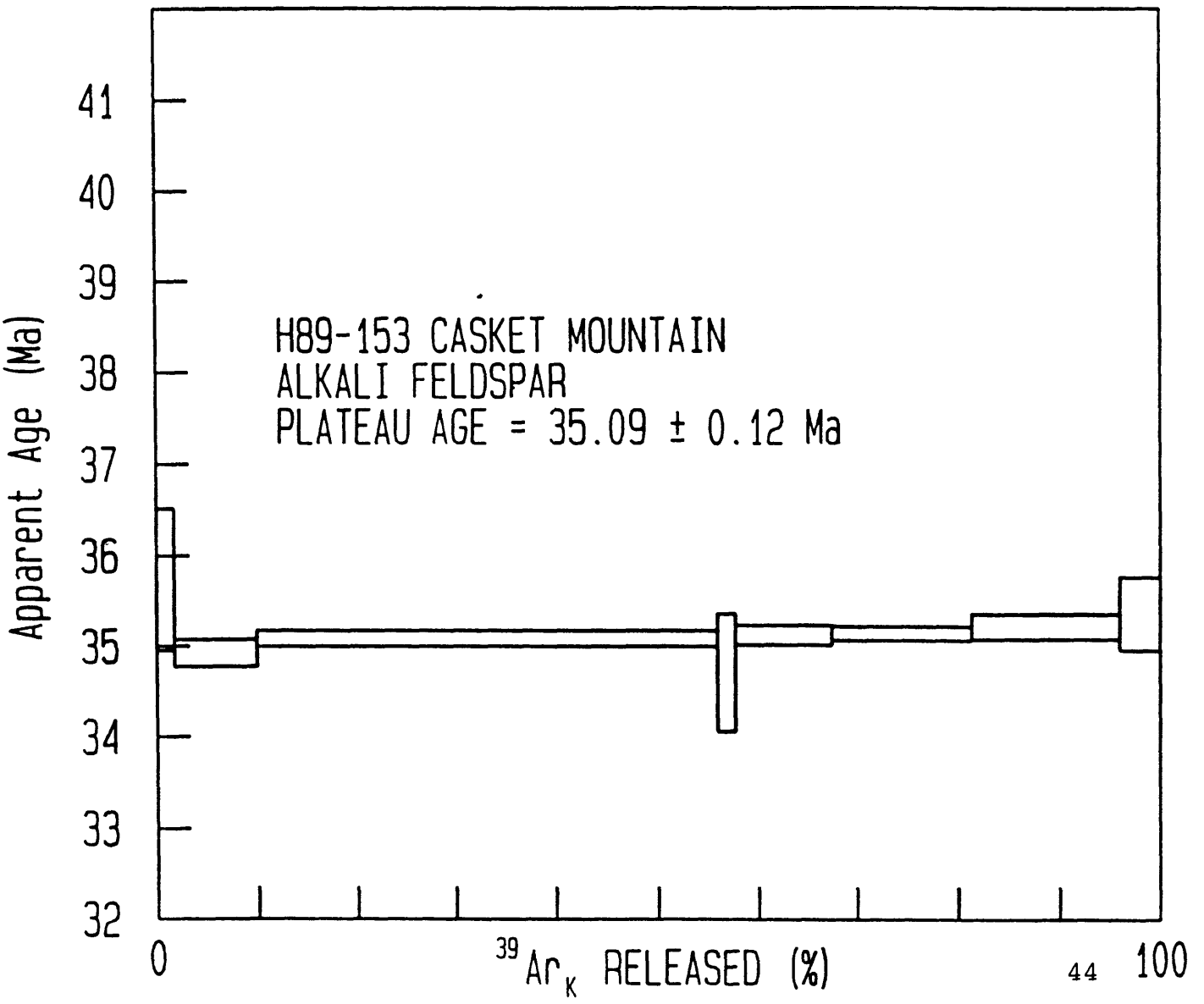
J = 0.004812 + 0.25% SAMPLE WT = 0.5006 g

TEMP C	Initial & radiogenic 40Ar	Potassium derived 39Ar	Chlorine derived 38Ar	Calcium derived 37Ar	Initial 36Ar	AGE* in Ma	**
970	3.714E-12	7.277E-13	9.425E-16	1.580E-14	2.328E-15	35.73 +	.39
1100	1.435E-11	3.464E-12	***	7.383E-14	9.524E-16	34.92 +	.08
1170	8.029E-11	1.955E-11	***	4.031E-13	1.722E-15	35.08 +	.04
1240	3.234E-12	7.549E-13	***	1.452E-14	***	34.71 +	.32
1300	1.698E-11	4.119E-12	***	8.358E-14	***	35.12 +	.05
1350	2.439E-11	5.912E-12	***	1.172E-13	***	35.14 +	.04
1400	2.571E-11	6.215E-12	***	1.200E-13	8.379E-16	35.21 +	.07
1650	7.692E-12	1.737E-12	***	3.291E-14	1.853E-15	35.36 +	.20
TOTAL GAS	1.764E-10	4.248E-11	9.425E-16	8.609E-13	9.615E-15	35.11	

79.6% of gas on plateau, steps 1100 through 1350 PLATEAU AGE = 35.09 + .1
90.1% of gas on plateau, steps 1170 through 1650 PLATEAU AGE = 35.13 + .1

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 02/05/91 16:04:51 7 Feb 1992 H89-153 RD73



v 02/05/91 H89-12 15:38:19 7 Feb 1992

R A W D A T A

FILE	TEMP	40Ar	39Ar	38Ar	37Ar	36Ar regression	TRAP CURRENT	MANIFOLD OPTION
24557	970	470106	66098	1343	2218	667	200	EALL
	+	218	47	16	6	8		
24558	1050	857906	208249	2762	6759	17	200	EALL
	+	431	206	7	11	7		
24559	1150	1716821	417360	5499	12983	19	200	EALL
	+	1242	169	11	5	6		
24560	1220	1938635	472264	6241	14319	12	200	EALL
	+	1353	243	17	10	12		
24561	1270	1569169	381347	5030	11235	21	200	EALL
	+	783	295	6	6	5		
24562	1320	1019766	247501	3248	7073	18	200	EALL
	+	380	117	8	9	9		
24563	1400	1282386	310148	4076	8613	13	200	EALL
	+	611	291	8	11	3		
24564	1650	476668	113880	1523	3109	32	200	EALL
	+	168	58	6	11	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
970	11	1375	376	887	0	2	0	1	0	125
1050	35	4194	1185	2795	0	7	0	3	-0	3
1150	71	8063	2374	5601	0	14	1	6	-0	3
1220	80	8901	2687	6338	0	16	1	6	-0	1
1270	65	6991	2169	5118	0	12	1	5	-0	3
1320	42	4405	1408	3322	0	8	0	3	-0	3
1400	53	5369	1764	4163	0	9	0	4	-0	2
1650	19	1940	648	1528	0	3	0	1	0	6

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-packag
A	970	3.0	57.8	9.54	274	4.104	35.33	+	.30	.32	.37
B	1050	9.4	99.5	9.86	0	4.087	35.19	+	.09	.12	.22
C	1150	18.8	99.8	10.28	0	4.092	35.23	+	.04	.10	.20
D	1220	21.3	99.9	10.55	0	4.089	35.21	+	.07	.11	.21
E	1270	17.2	99.7	10.85	0	4.090	35.22	+	.04	.10	.20
F	1320	11.2	99.6	11.18	0	4.090	35.21	+	.09	.13	.22
G	1400	14.0	99.8	11.50	0	4.113	35.42	+	.03	.09	.20
H	1650	5.1	98.1	11.70	65409	4.094	35.25	+	.07	.12	.21

Total gas K/Ca = 10.7

Precisions are 1 sigma, measured in Ma. Measured 40/36 atm = 297.2 +.5
J = 0.004820 + 0.25% (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

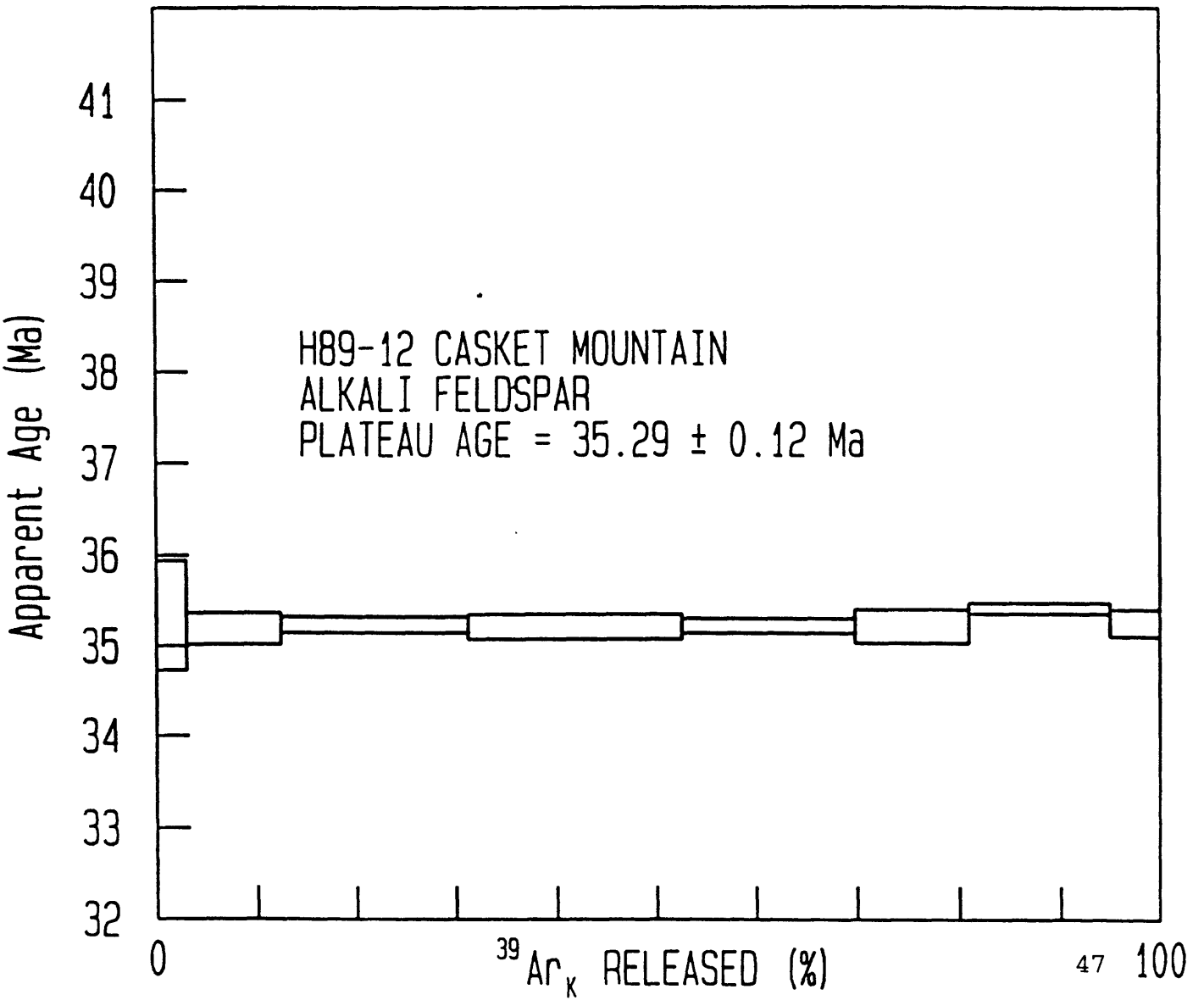
J = 0.004820 + 0.25% SAMPLE WT = 0.5009 g

TEMP C	Initial & radiogenic 40Ar	Potassium derived 39Ar	Chlorine derived 38Ar	Calcium derived 37Ar	Initial 36Ar	AGE* in Ma		**
970	9.395E-12	1.324E-12	1.169E-14	7.216E-14	1.340E-14	35.33	+	.30
1050	1.713E-11	4.172E-12	***	2.200E-13	***	35.19	+	.09
1150	3.429E-11	8.360E-12	***	4.227E-13	***	35.23	+	.04
1220	3.872E-11	9.460E-12	***	4.664E-13	***	35.21	+	.07
1270	3.134E-11	7.639E-12	***	3.661E-13	***	35.22	+	.04
1320	2.037E-11	4.958E-12	***	2.305E-13	***	35.21	+	.09
1400	2.561E-11	6.213E-12	***	2.808E-13	***	35.42	+	.03
1650	9.520E-12	2.281E-12	***	1.014E-13	***	35.25	+	.07
TOTAL GAS	1.864E-10	4.441E-11	1.178E-14	2.160E-12	1.553E-14	35.25		

100.0% of gas on plateau, steps 970 through 1650 PLATEAU AGE = 35.29 + .1

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 02/05/91 15:39:57 7 Feb 1992 H89-12 RD73



v 02/05/91 (40/36in = 295.5)

R A W D A T A

FILE	TEMP	40Ar	39Ar	38Ar	37Ar	36Ar	TRAP CURRENT	MANIFOLD OPTION
					ä	*		
32442	900	167000	38026	489	81	28	200	EALL
	▪	108	41	2	6	7		
32443	1025	115161	26391	336	55	8	200	EALL
	▪	32	41	16	8	3		
32444	1120	84982	18757	151	56	17	200	EALL
	▪	45	12	12	11	3		
32445	1200	811011	190169	2411	425	21	200	EALL
	▪	598	146	6	13	7		
32446	1280	1243133	289332	3661	666	26	200	EALL
	▪	1266	316	14	6	7		
32447	1380	274671	61568	827	146	33	200	EALL
	▪	95	29	26	7	5		

* 36Ar peak values less than 20 are means those above 20 are from linear regressions

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 Initial 36Ar	38Ar
900	43	1605	217	511	0	1	0	0	-0	5
1025	30	1094	150	355	0	1	0	0	-0	2
1120	21	1121	107	252	0	1	0	0	-0	3
1200	213	8454	1083	2555	0	6	0	2	-0	4
1280	325	13238	1648	3887	0	9	0	4	-0	4
1380	69	2911	351	827	0	2	0	1	0	6

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	intra-package	inter-package
A	900	6.1	95.0	11.71	0	4.157	34.42	▪	.46	.47	.50
B	1025	4.2	97.9	11.92	0	4.257	35.24	▪	.30	.31	.36
C	1120	3.0	94.2	8.27	0	4.254	35.21	▪	.40	.41	.45
D	1200	30.5	99.3	11.12	0	4.219	34.93	▪	.10	.13	.22
E	1280	46.3	99.5	10.80	0	4.257	35.24	▪	.07	.11	.21
F	1380	9.9	96.5	10.45	19225	4.290	35.51	▪	.19	.21	.28

Total gas K/Ca = 10.9

Precisions are 1 sigma, measured in Ma. Measured 40/36 atm = 297.2 ▪.5
J = 0.004634 ▪ 0.25% (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: 2.07 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

v 06/13/92 19:32:33 17 Apr 1993

H89-47 KSPAR #7 RD86

J = 0.004634 ▪ 0.25% SAMPLE WT = 0.2422 g

TEMP C	Initial & radiogenic 40Ar	Potassium derived 39Ar	Chlorine derived 38Ar	Calcium derived 37Ar	Initial 36Ar	AGE* in Ma	**
900	5.092E-12	1.164E-12	***	5.171E-14	***	34.42 ▪	.46
1025	3.512E-12	8.078E-13	***	3.523E-14	***	35.24 ▪	.30
1120	2.591E-12	5.741E-13	***	3.610E-14	***	35.21 ▪	.40
1200	2.473E-11	5.821E-12	***	2.723E-13	***	34.93 ▪	.10
1280	3.791E-11	8.856E-12	***	4.264E-13	***	35.24 ▪	.07
1380	8.376E-12	1.885E-12	***	9.374E-14	***	35.51 ▪	.19
TOTAL GAS	8.221E-11	1.911E-11	***	9.154E-13	3.875E-15	35.12	

56.2% of gas on plateau, steps 1280 through 1380 PLATEAU AGE = 35.27 + .12

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

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

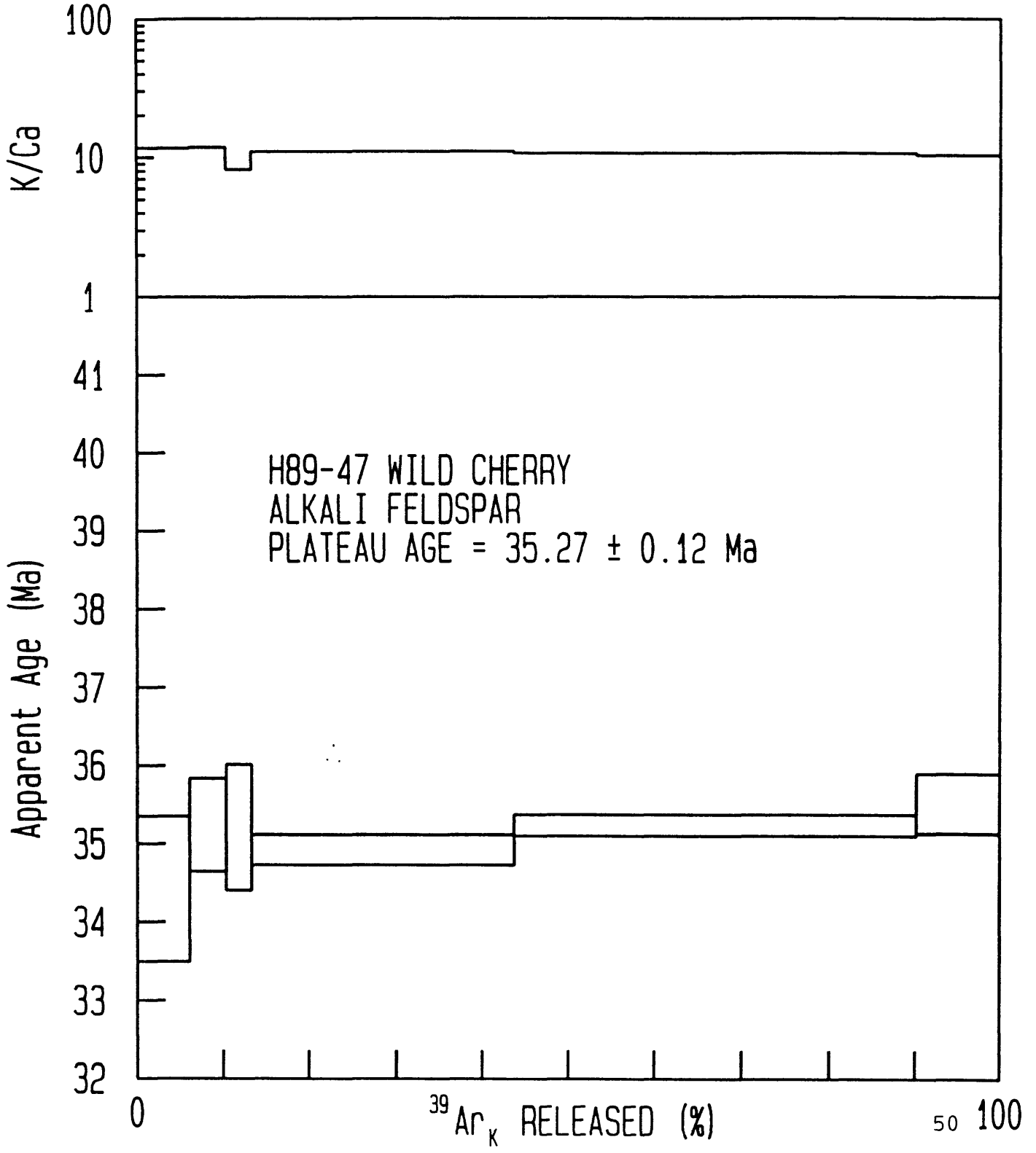
** 1-sigma precision estimates are for intra-sample reproducibility.

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

*** below detection limit

v 06/13/92

v 06/13/92 19:38:06 17 Apr 1993 H89-47 KSPAR #7 RD86



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

GKR-1

R A W D A T A

FILE	TEMP	40Ar	39Ar	38Ar	37Ar	36Ar mean	TRAP CURRENT	MANIFOLD OPTION
19658:	750	306118	67824	954	1888	130	200	ALL
	±	179	27	48	14	11		
19659:	900	1164023	289217	3768	7731	76	200	ALL
	±	725	115	38	15	9		
19660:	1075	3494632	868738	11295	20957	179	200	ALL
	±	1093	402	34	17	11		
19661:	1120	1832513	453516	5934	10390	125	200	ALL
	±	614	53	59	14	6		
19662:	1150	1473421	358896	4720	8122	165	200	ALL
	±	1091	338	47	12	17		
19663:	1180	1392659	344113	4526	7722	84	200	ALL
	±	528	211	45	21	8		
19664:	1220	1952638	481315	6454	10487	156	200	ALL
	±	713	197	32	16	5		
19665:	1450	3643745	898835	11854	19507	266	200	ALL
	±	1383	302	36	30	13		

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	K-derived 38Ar	K-derived 37Ar	Ca-derived 39Ar	Ca-derived 38Ar	Ca-derived 36Ar	Cl-der 36Ar	Initial 38Ar
750	32	5126	386	910	0	5	0	2	0	24
900	139	21001	1645	3880	0	19	1	8	-0	13
1075	416	56958	4941	11656	0	53	2	21	-0	30
1120	217	28264	2579	6085	0	26	1	10	-0	22
1150	172	22105	2041	4815	0	20	1	8	-0	29
1180	165	21034	1957	4617	0	19	1	8	-0	14
1220	231	28582	2737	6458	0	26	1	10	0	27
1450	431	53197	5112	12060	0	49	2	19	-0	46

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	1.8	87.6	5.02	2365	3.942	35.22	±	.41	.42	.45
B	900	7.7	98.3	5.23	0	3.944	35.24	±	.08	.12	.22
C	1075	23.1	98.7	5.79	0	3.958	35.36	±	.04	.10	.20
D	1120	12.1	98.1	6.09	0	3.955	35.33	±	.04	.10	.20
E	1150	9.5	96.8	6.17	0	3.965	35.42	±	.13	.16	.24
F	1180	9.1	98.4	6.21	0	3.970	35.47	±	.07	.11	.21
G	1220	12.8	97.8	6.40	34674	3.956	35.35	±	.03	.09	.20
H	1450	23.9	98.0	6.42	0	3.962	35.39	±	.04	.10	.20

Total gas K/Ca = 6.1

Precisions are 1 sigma, measured in Ma. Measured 40/36 atm = 296.5 ±.5
J = 0.005001 ± 0.25% (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 = 6.000E-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±4.0E-03

GKR-1

J = 0.005001 ± 0.25% SAMPLE WT = 0.3300 g

TEMP C	Initial & radiogenic 40Ar	Potassium derived 39Ar	Chlorine derived 38Ar	Calcium derived 37Ar	Initial 36Ar	AGE* in Ma	**
750	1.834E-12	4.075E-13	4.170E-16	4.219E-14	7.727E-16	35.22 ±	.42
900	6.974E-12	1.737E-12	***	1.728E-13	4.114E-16	35.24 ±	.12
1075	2.094E-11	5.219E-12	***	4.687E-13	9.547E-16	35.36 ±	.10
1120	1.098E-11	2.725E-12	***	2.325E-13	6.925E-16	35.33 ±	.10
1150	8.828E-12	2.156E-12	***	1.818E-13	9.466E-16	35.42 ±	.16
1180	8.344E-12	2.067E-12	***	1.730E-13	4.619E-16	35.47 ±	.11
1220	1.170E-11	2.892E-12	***	2.350E-13	8.765E-16	35.35 ±	.09
1450	2.183E-11	5.400E-12	***	4.373E-13	1.486E-15	35.39 ±	.10
TOTAL GAS	9.143E-11	2.260E-11	6.188E-16	1.943E-12	6.602E-15	35.37	

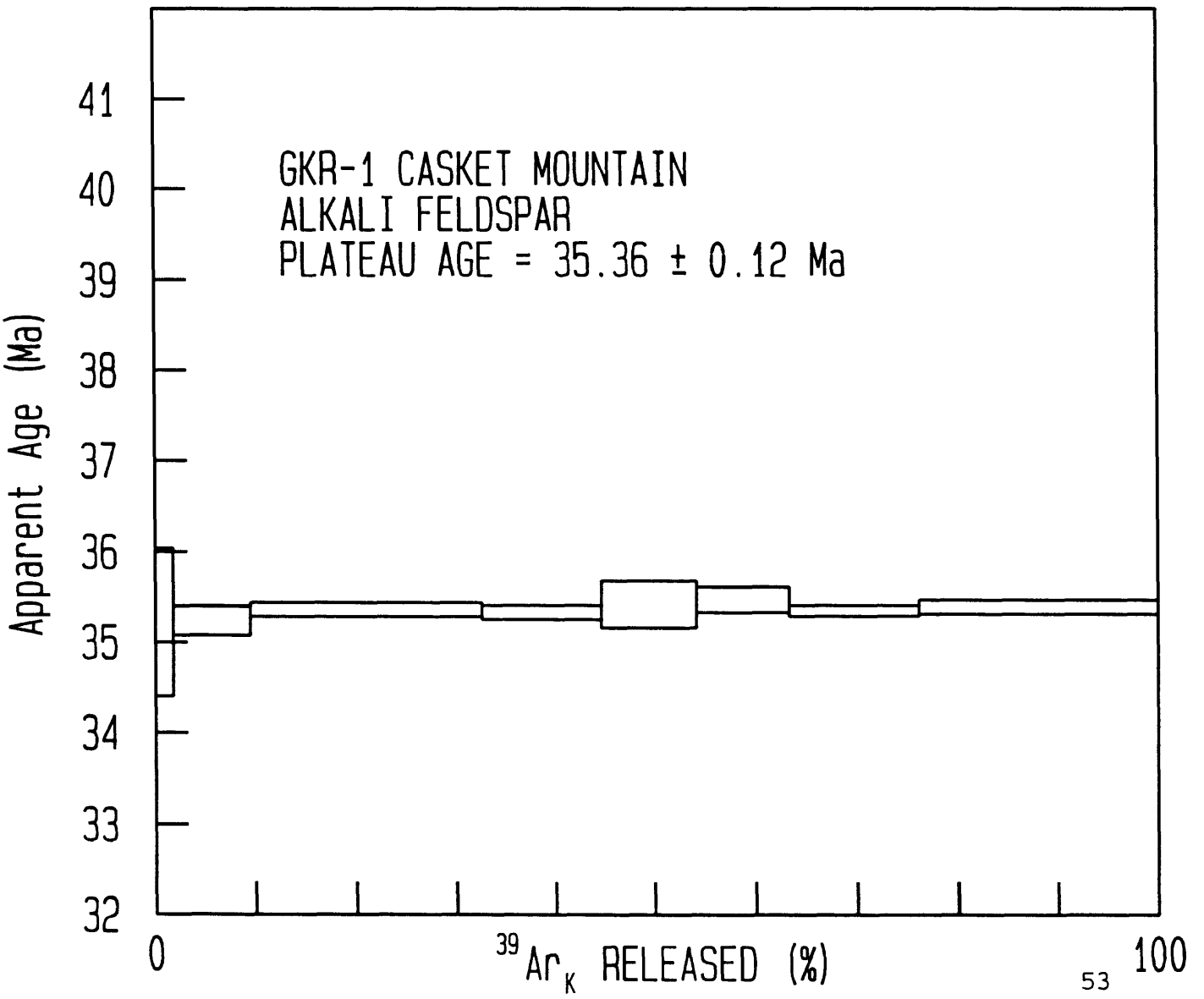
K/Ca = 6.1

100.0% of gas on plateau, steps 750 through 1450 PLATEAU AGE = 35.36 ± .12

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 2/18/89

v 08/23/93 10:19:08 7 Dec 1993 444



v 08/23/93 (40/36in = 295.5)

J87-41

R A W D A T A

FILE	TEMP	40Ar	39Ar	38Ar	37Ar	36Ar mean	TRAP CURRENT	MANIFOLD OPTION
19610:	750	863722	209743	2743	1166	76	200	ALL
	±	419	132	82	9	10		
19611:	900	3048309	762680	9844	3735	65	200	ALL
	±	862	183	49	18	18		
19612:	1075	3309940	829177	10734	4436	46	200	ALL
	±	545	203	32	8	17		
19613:	1120	2564102	645052	8444	4610	58	200	ALL
	±	1122	190	42	10	11		
19614:	1150	1944711	488093	6386	3397	53	200	ALL
	±	609	165	32	17	11		
19615:	1180	1804780	451424	5910	2975	55	200	ALL
	±	703	126	59	19	17		
19616:	1220	1813986	451355	5907	2831	61	200	ALL
	±	504	122	59	8	6		
19617:	1300	1425752	351298	4557	2176	58	200	ALL
	±	326	91	46	13	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	97	2965	1193	2814	0	3	0	1	-0	14
900	352	9506	4338	10233	0	9	0	4	-0	11
1075	383	11298	4716	11125	0	11	1	4	-0	8
1120	298	11750	3669	8655	0	11	1	4	-0	10
1150	225	8663	2776	6549	0	8	0	3	-0	9
1180	209	7591	2567	6057	0	7	0	3	-0	10
1220	209	7231	2567	6056	0	7	0	3	-0	11
1300	162	5562	1998	4713	0	5	0	2	-0	11

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	5.0	97.4	26.37	0	4.001	35.73	±	.13	.16	.24
B	900	18.2	99.4	29.91	0	3.962	35.38	±	.06	.11	.21
C	1075	19.6	99.6	27.37	0	3.966	35.42	±	.05	.10	.21
D	1120	15.4	99.4	20.48	0	3.940	35.18	±	.05	.10	.20
E	1150	11.7	99.2	21.02	0	3.943	35.22	±	.06	.11	.21
F	1180	10.6	99.1	22.19	0	3.953	35.30	±	.10	.13	.22
G	1220	10.6	99.1	23.30	0	3.970	35.45	±	.04	.10	.20
H	1300	8.4	98.8	23.58	0	4.000	35.72	±	.11	.14	.23

Total gas K/Ca = 24.7

Precisions are 1 sigma, measured in Ma. Measured 40/36 atm = 296.5 ±.5
J = 0.004999 ± 0.25% (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 = 6.000E-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±4.0E-03

v 2/18/89

J87-41

J = 0.004999 ± 0.25% SAMPLE WT = 0.3301 g

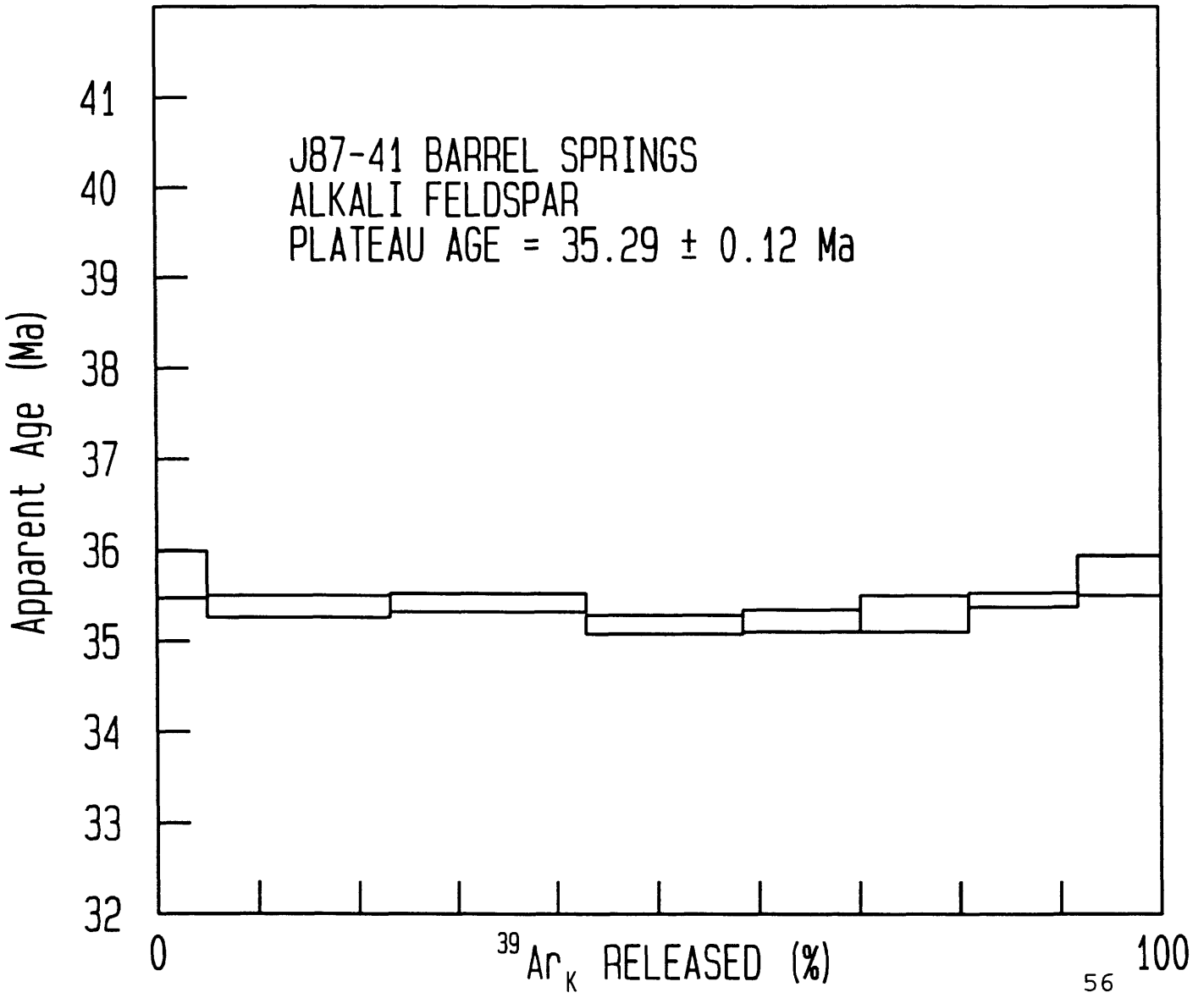
TEMP C	Initial & radiogenic 40Ar	Potassium derived 39Ar	Chlorine derived 38Ar	Calcium derived 37Ar	Initial 36Ar	AGE* in Ma	**
750	5.175E-12	1.260E-12	***	2.485E-14	4.522E-16	35.73 ±	.16
900	1.826E-11	4.582E-12	***	7.965E-14	3.681E-16	35.38 ±	.11
1075	1.983E-11	4.982E-12	***	9.465E-14	2.522E-16	35.42 ±	.10
1120	1.536E-11	3.875E-12	***	9.841E-14	3.203E-16	35.18 ±	.10
1150	1.165E-11	2.932E-12	***	7.254E-14	2.994E-16	35.22 ±	.11
1180	1.081E-11	2.712E-12	***	6.355E-14	3.132E-16	35.30 ±	.13
1220	1.087E-11	2.712E-12	***	6.053E-14	3.483E-16	35.45 ±	.10
1300	8.543E-12	2.111E-12	***	4.655E-14	3.388E-16	35.72 ±	.14
TOTAL GAS	1.005E-10	2.517E-11	***	5.407E-13	2.693E-15	35.38	
	K/Ca = 24.7						

75.8% of gas on plateau, steps 900 through 1180 PLATEAU AGE = 35.29 ± .12

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 2/18/89

v 08/23/93 10:39:59 7 Dec 1993



v 08/23/93 (40/36in = 295.5)

v 02/05/91 J87-44 15:32:50 7 Feb 1992

R A W D A T A

FILE	TEMP	40Ar	39Ar	38Ar	37Ar	36Ar regression	TRAP CURRENT	MANIFOLD OPTION
24544	970	889003	202314	2890	2714	162	200	EALL
	+	320	192	7	8	6		
24545	1050	937038	225850	3001	2772	35	200	EALL
	+	707	49	17	11	2		
24546	1150	1154757	278773	3696	3438	10	200	EALL
	+	441	220	20	16	5		
24547	1220	2133417	515058	6903	8497	45	200	EALL
	+	1556	392	16	10	10		
24548	1270	1833399	441390	5869	6672	61	200	EALL
	+	544	230	8	22	8		
24549	1320	1171462	280324	3727	4010	46	200	EALL
	+	501	138	11	9	6		
24550	1400	969931	230534	3049	3146	39	200	EALL
	+	85	178	14	10	6		
24551	1650	364971	85340	1067	1144	43	200	EALL
	+	140	77	19	6	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
970	34	1655	1151	2715	0	3	0	1	0	30
1050	38	1692	1285	3031	0	3	0	1	-0	6
1150	47	2101	1586	3742	0	4	0	1	-0	2
1220	86	5197	2930	6913	0	9	0	4	0	8
1270	74	4085	2511	5924	0	7	0	3	-0	11
1320	47	2458	1595	3762	0	4	0	2	-0	8
1400	39	1930	1312	3094	0	3	0	1	-0	7
1650	14	703	486	1145	0	1	0	0	-0	8

All values in counts, corrected for mass discrimination

v 02/05/91 J87-44 15:32:51 7 Feb 1992

	TEMP C	% TOT 39Ar	RAD YIELD	APP K/Ca	APP K/Cl	F	AGE (Ma)	intra-sample	precision intra-package	precision inter-packag
A	970	9.0	94.6	24.02	2296	4.145	35.61 +	.07	.12	.21
B	1050	10.0	98.9	26.24	0	4.093	35.16 +	.03	.09	.20
C	1150	12.3	99.8	26.10	0	4.121	35.40 +	.05	.10	.21
D	1220	22.8	99.4	19.51	72374	4.106	35.27 +	.06	.11	.21
E	1270	19.5	99.1	21.28	0	4.103	35.24 +	.05	.10	.20
F	1320	12.4	98.9	22.48	0	4.120	35.40 +	.05	.10	.21
G	1400	10.2	98.8	23.55	0	4.147	35.62 +	.06	.11	.21
H	1650	3.8	96.5	23.96	0	4.117	35.37 +	.09	.13	.22

Total gas K/Ca = 22.7

Precisions are 1 sigma, measured in Ma. Measured 40/36 atm = 297.2 +.5
J = 0.004809 + 0.25% (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

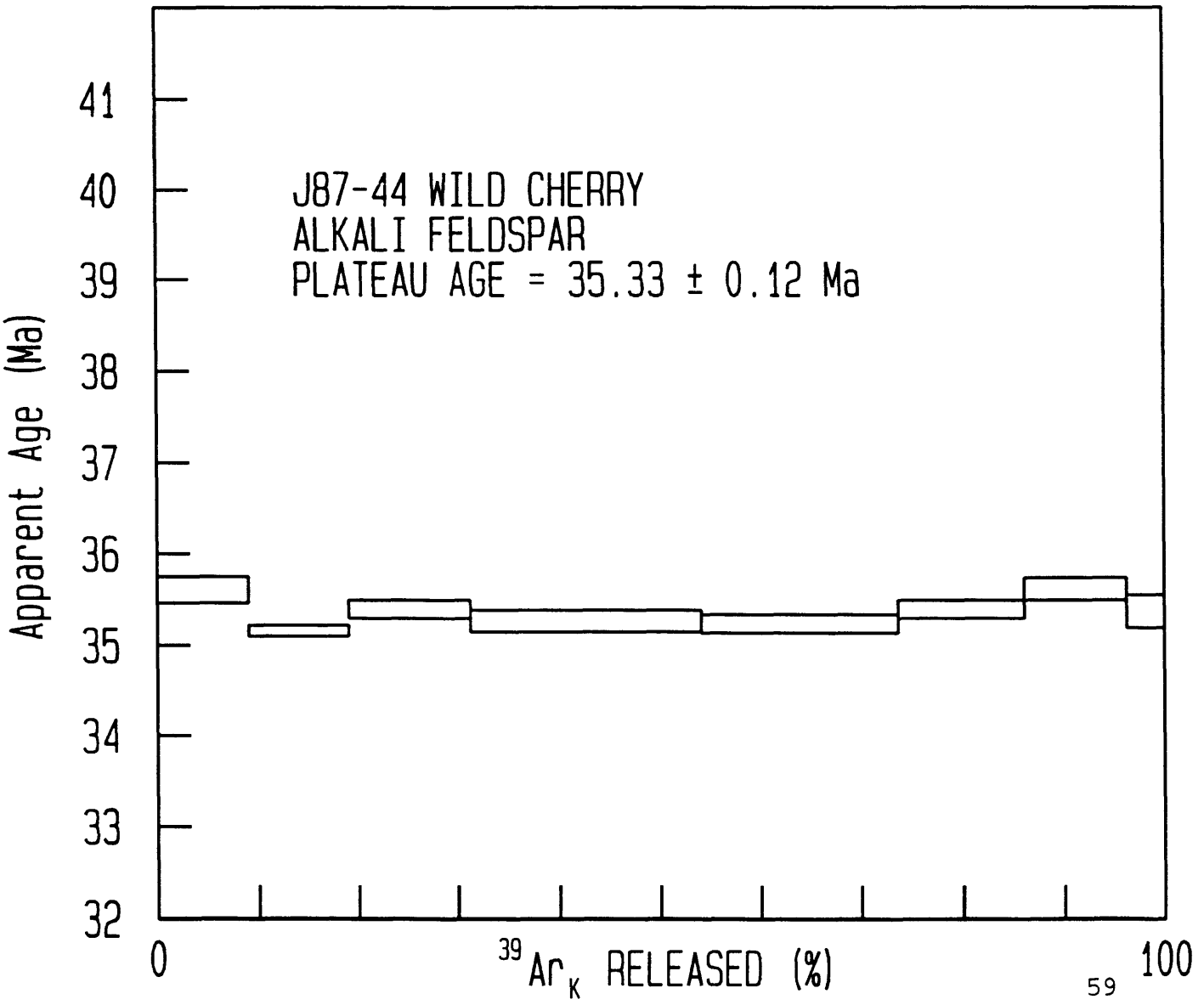
J = 0.004809 + 0.25% SAMPLE WT = 0.5010 g

TEMP C	Initial & radiogenic 40Ar	Potassium derived 39Ar	Chlorine derived 38Ar	Calcium derived 37Ar	Initial 36Ar	AGE* in Ma	**
970	1.776E-11	4.053E-12	4.271E-15	8.775E-14	3.240E-15	35.61 +	.07
1050	1.872E-11	4.524E-12	***	8.966E-14	***	35.16 +	.03
1150	2.306E-11	5.584E-12	***	1.113E-13	***	35.40 +	.05
1220	4.261E-11	1.032E-11	***	2.751E-13	8.407E-16	35.27 +	.06
1270	3.662E-11	8.842E-12	***	2.161E-13	1.164E-15	35.24 +	.05
1320	2.340E-11	5.615E-12	***	1.299E-13	8.814E-16	35.40 +	.05
1400	1.937E-11	4.618E-12	***	1.020E-13	***	35.62 +	.06
1650	7.290E-12	1.710E-12	***	3.710E-14	8.515E-16	35.37 +	.09
TOTAL GAS	1.888E-10	4.526E-11	4.616E-15	1.049E-12	8.575E-15	35.36	

67.1% of gas on plateau, steps 1150 through 1320 PLATEAU AGE = 35.33 + .1

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 08/23/93 10:51:51 7 Dec 1993



v 08/23/93 (40/36in = 295.5)

R A W D A T A

FILE	TEMP	40Ar	39Ar	38Ar	37Ar	36Ar *	TRAP CURRENT	MANIFOLD OPTION
32253	900	157246	35967	448	60	14	200	EALL
	▪	138	43	12	11	3		
32254	1025	567300	131460	1671	240	22	200	EALL
	▪	477	109	7	18	6		
32255	1120	703296	163269	2088	309	18	200	EALL
	▪	839	222	14	10	8		
32256	1200	1567210	364182	4623	712	34	200	EALL
	▪	1536	381	6	6	10		
32257	1280	690564	159154	2012	309	21	200	EALL
	▪	93	103	11	11	4		
32258	1380	47181	10067	84	37	10	200	EALL
	▪	71	10	10	15	6		

* 36Ar peak values less than 20 are means those above 20 are from linear regressions

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	36	856	205	483	0	1	0	0	-0	3
1025	132	3419	749	1766	0	2	0	1	-0	4
1120	164	4402	930	2193	0	3	0	1	-0	3
1200	366	10141	2074	4892	0	7	0	3	-0	6
1280	160	4399	906	2138	0	3	0	1	-0	4
1380	10	521	57	135	0	0	0	0	-0	2

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	4.2	97.3	20.37	0	4.240	34.81 ▪	.22	.23	.29
B 1025	15.2	98.9	18.65	0	4.252	34.91 ▪	.11	.14	.23
C 1120	18.9	99.3	17.99	0	4.260	34.98 ▪	.13	.15	.23
D 1200	42.1	99.4	17.42	0	4.262	35.00 ▪	.08	.12	.21
E 1280	18.4	99.1	17.55	0	4.285	35.18 ▪	.07	.11	.21
F 1380	1.2	93.6	9.37	0	4.373	35.90 ▪	1.48	1.48	1.49

Total gas K/Ca = 17.8

Precisions are 1 sigma, measured in Ma. Measured 40/36 atm = 297.2 ▪.5
J = 0.004596 ▪ 0.25% (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: 2.07 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

v 06/13/92 19:46:32 17 Apr 1993

H89-151 KSPAR #13&14 RD86

J = 0.004596 ▪ 0.25% SAMPLE WT = 0.4638 g

TEMP C	Initial & radiogenic 40Ar	Potassium derived 39Ar	Chlorine derived 38Ar	Calcium derived 37Ar	Initial 36Ar	AGE* in Ma	**
900	4.795E-12	1.101E-12	***	2.811E-14	***	34.81 ▪	.22
1025	1.730E-11	4.024E-12	***	1.122E-13	***	34.91 ▪	.11
1120	2.144E-11	4.997E-12	***	1.445E-13	***	34.98 ▪	.13
1200	4.779E-11	1.115E-11	***	3.328E-13	***	35.00 ▪	.08
1280	2.106E-11	4.871E-12	***	1.444E-13	***	35.18 ▪	.07
1380	1.439E-12	3.081E-13	***	1.710E-14	***	35.90 ▪	1.48
TOTAL GAS	1.138E-10	2.645E-11	***	7.790E-13	3.475E-15	35.02	

80.4% of gas on plateau, steps 900 through 1200 PLATEAU AGE = 34.96 + .12

80.6% of gas on plateau, steps 1120 through 1380 PLATEAU AGE = 35.09 + .12

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

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

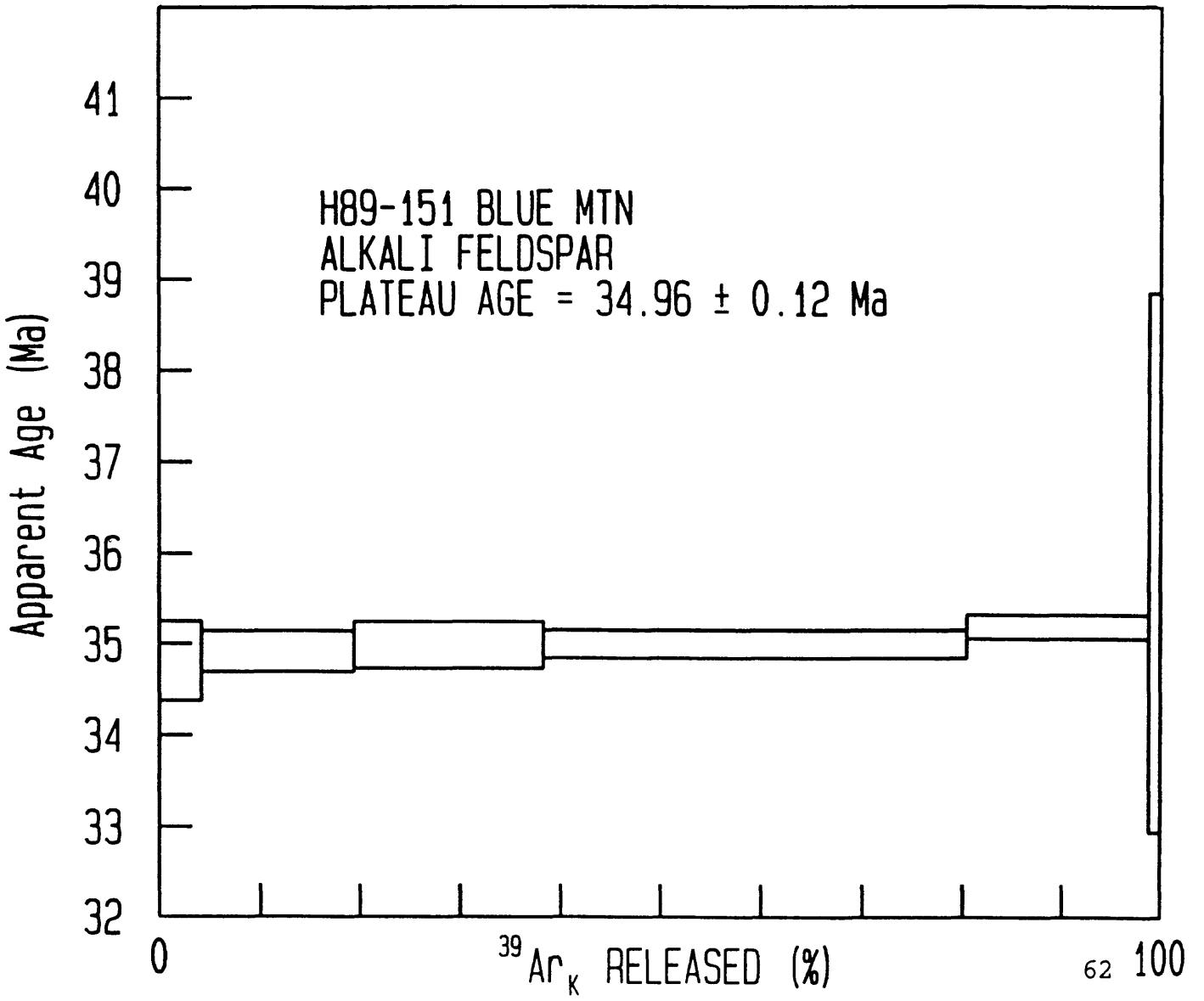
** 1-sigma precision estimates are for intra-sample reproducibility.

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

*** below detection limit

v 06/13/92

v 06/13/92 19:53:36 17 Apr 1993 H89-151 KSPAR #13&14 RD86



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

v 06/13/92 H89-143 #41 RD92 KSPAR 10:40:42 24 Feb 1993

R A W D A T A

FILE	TEMP	40Ar	39Ar	38Ar	37Ar	36Ar	TRAP CURRENT	MANIFOLD OPTION
					ä	*		
35451	1230	891131	219610	2822	615	130	200	EALL
	▪	741	179	6	13	9		
35452	1300	1850857	467352	5946	1278	97	200	EALL
	▪	1372	456	4	10	4		
35453	1450	86458	19857	158	31	26	200	EALL
	▪	207	30	11	13	3		

* 36Ar peak values less than 10 are means those above 10 are from linear regressions

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
1230	188	5607	1250	2950	0	4	0	2	-0	24
1300	399	11666	2661	6277	0	9	0	3	-0	18
1450	17	285	113	267	0	0	0	0	-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)	precision intra-sample	precision intra-package	precision inter-package
A 1230	31.1	95.7	18.31	0	3.870	35.19 ▪	.12	.15	.23
B 1300	66.1	98.5	18.73	0	3.886	35.33 ▪	.03	.10	.20
C 1450	2.8	90.9	32.59	0	3.945	35.87 ▪	.38	.39	.43
Total gas K/Ca =			19.0						

Precisions are 1 sigma, measured in Ma. Measured 40/36 atm = 297.3 ▪.5
J = 0.005090 ▪ 0.25% (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: 2.07 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

v 06/13/92 10:40:52 24 Feb 1993

H89-143 #41 RD92 KSPAR

J = 0.005090 ▪ 0.25% SAMPLE WT = 0.2516 g

TEMP C	Initial & radiogenic 40Ar	Potassium derived 39Ar	Chlorine derived 38Ar	Calcium derived 37Ar	Initial 36Ar	AGE* in Ma	**
1230	2.717E-11	6.721E-12	***	1.908E-13	3.932E-15	35.19 ▪	.12
1300	5.643E-11	1.430E-11	***	3.970E-13	2.881E-15	35.33 ▪	.03
1450	2.636E-12	6.077E-13	***	9.696E-15	***	35.87 ▪	.38
TOTAL GAS	8.624E-11	2.163E-11	***	5.975E-13	7.621E-15	35.30	

100.0% of gas on plateau, steps 1230 through 1450 PLATEAU AGE = 35.32 + .12

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

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

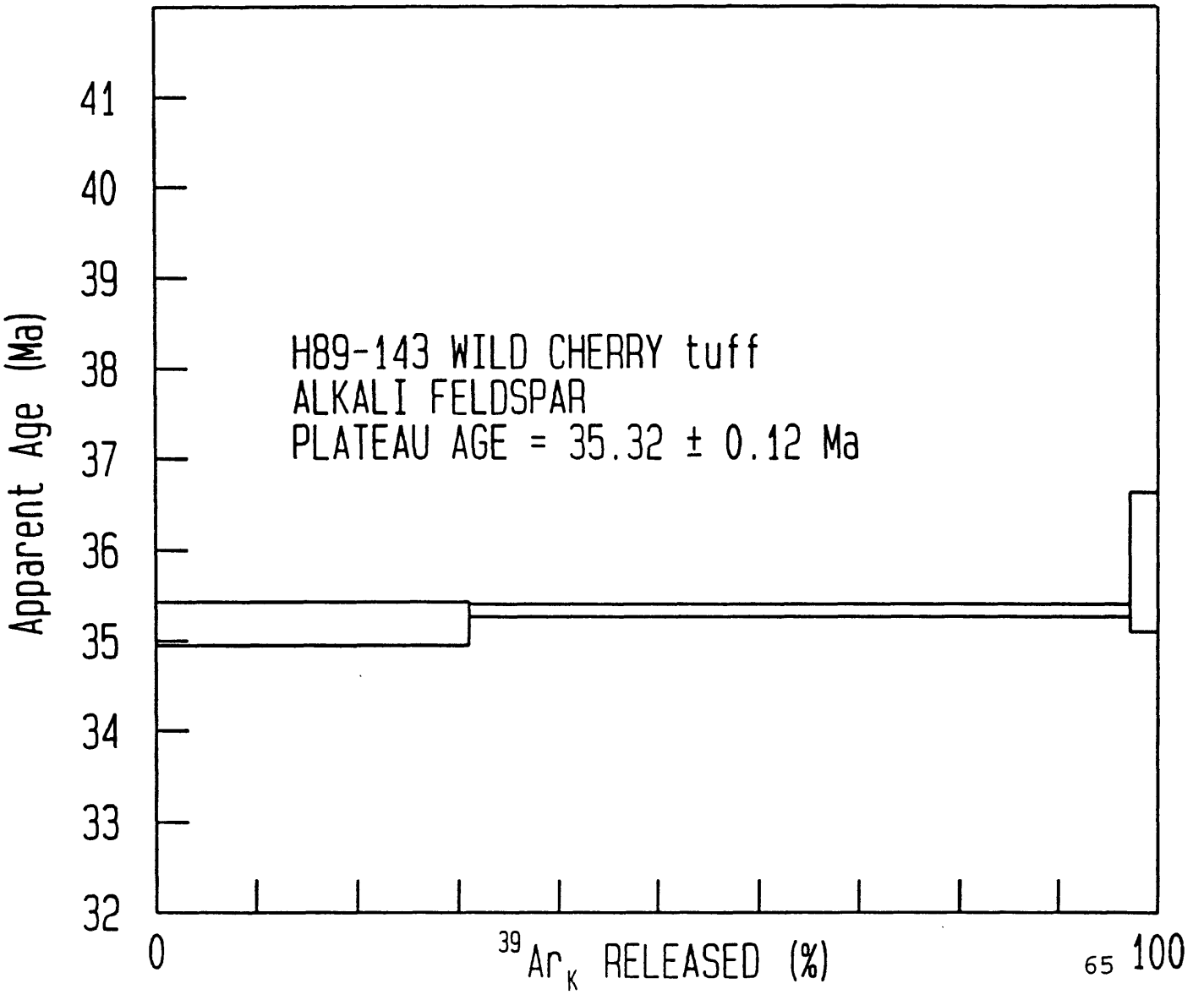
** 1-sigma precision estimates are for intra-sample reproducibility.

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

*** below detection limit

v 06/13/92

v 06/13/92 10:51:13 24 Feb 1993 H89-143 #41 RD92 KSPAR



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

BS-3

R A W D A T A

FILE	TEMP	40Ar	39Ar	38Ar	37Ar	36Ar mean	TRAP CURRENT	MANIFOLD OPTION
19600:	750	555016	75387	1149	710	818	200	ALL
	±	106	19	34	31	18		
19601:	900	1377632	285468	3864	2686	816	200	ALL
	±	354	94	39	15	22		
19602:	1075	3853398	916468	11973	8652	791	200	ALL
	±	1688	473	36	14	19		
19603:	1120	2468596	598009	7810	5645	374	200	ALL
	±	2019	553	39	3	12		
19604:	1150	2002417	491427	6404	4642	225	200	ALL
	±	428	122	32	18	17		
19605:	1180	2023185	499547	6477	4733	191	200	ALL
	±	818	164	32	9	6		
19606:	1220	2575648	639608	8270	6114	183	200	ALL
	±	1023	190	41	16	15		
19607:	1300	3950026	983102	12643	9307	198	200	ALL
	±	1330	526	38	14	13		

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	K-derived 38Ar	K-derived 37Ar	Ca-derived 39Ar	Ca-derived 38Ar	Ca-derived 36Ar	Cl-der 36Ar	Initial 38Ar
750	34	1778	429	1011	0	2	0	1	0	153
900	131	6733	1624	3830	0	6	0	2	0	153
1075	419	21696	5212	12296	0	20	1	8	-0	147
1120	274	14168	3401	8024	0	13	1	5	-0	69
1150	225	11657	2795	6594	0	11	1	4	-0	41
1180	229	11897	2841	6703	0	11	1	4	-0	35
1220	293	15376	3638	8582	0	14	1	6	-0	33
1300	451	23418	5591	13190	0	22	1	9	-0	36

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	1.7	56.3	15.74	625	4.135	37.20	±	.63	.64	.66
B	900	6.4	82.5	15.74	3593	3.970	35.73	±	.21	.23	.29
C	1075	20.4	94.0	15.68	0	3.941	35.46	±	.06	.11	.21
D	1120	13.3	95.6	15.68	0	3.935	35.41	±	.07	.11	.21
E	1150	10.9	96.7	15.66	0	3.931	35.38	±	.09	.13	.22
F	1180	11.1	97.3	15.60	0	3.929	35.36	±	.04	.10	.20
G	1220	14.2	98.0	15.46	0	3.934	35.41	±	.06	.11	.21
H	1300	21.9	98.6	15.60	0	3.950	35.55	±	.04	.10	.20
Total gas K/Ca =				15.6							

Precisions are 1 sigma, measured in Ma. Measured 40/36 atm = 296.5 ±.5
J = 0.005038 ± 0.25% (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 = 6.000E-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±4.0E-03

v 2/18/89

BS-3

J = 0.005038 ± 0.25% SAMPLE WT = 0.3298 g

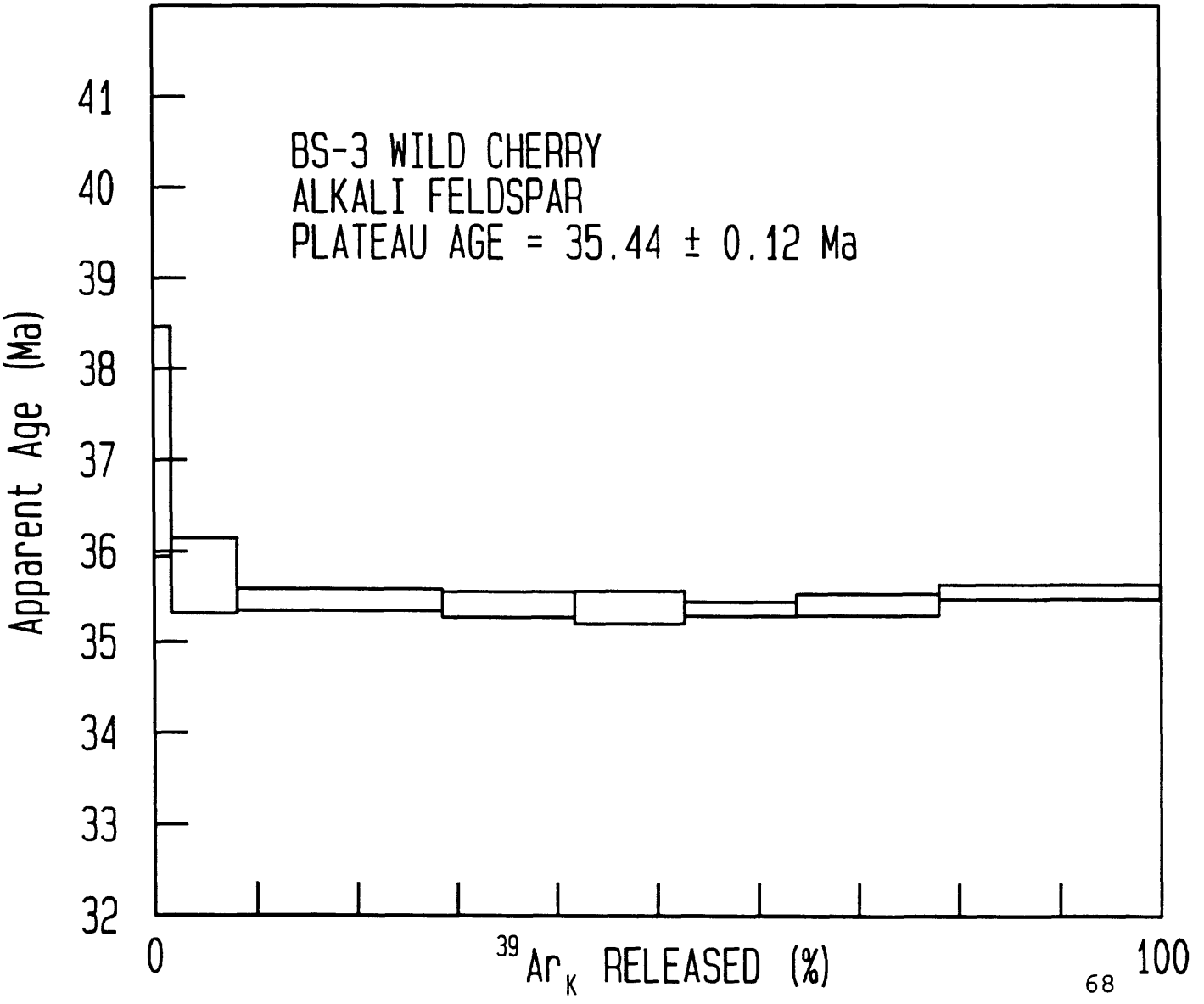
TEMP C	Initial & radiogenic 40Ar	Potassium derived 39Ar	Chlorine derived 38Ar	Calcium derived 37Ar	Initial 36Ar	AGE* in Ma	**
750	3.328E-12	4.529E-13	1.755E-15	1.496E-14	4.923E-15	37.20 ±	.64
900	8.256E-12	1.715E-12	1.155E-15	5.666E-14	4.896E-15	35.73 ±	.23
1075	2.309E-11	5.506E-12	***	1.825E-13	4.712E-15	35.46 ±	.11
1120	1.479E-11	3.593E-12	***	1.192E-13	2.217E-15	35.41 ±	.11
1150	1.200E-11	2.952E-12	***	9.804E-14	1.326E-15	35.38 ±	.13
1180	1.212E-11	3.001E-12	***	1.000E-13	1.121E-15	35.36 ±	.10
1220	1.543E-11	3.843E-12	***	1.293E-13	1.065E-15	35.41 ±	.11
1300	2.367E-11	5.906E-12	***	1.968E-13	1.142E-15	35.55 ±	.10
TOTAL GAS	1.127E-10	2.697E-11	2.910E-15	8.975E-13	2.140E-14	35.49	
	K/Ca = 15.6						

98.3% of gas on plateau, steps 900 through 1300 PLATEAU AGE = 35.44 ± .12

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 2/18/89

v 08/23/93 11:20:49 7 Dec 1993



v 08/23/93 (40/36in = 295.5)

v 02/05/91 H89-174 KSPAR #3,4 RD81 00:55:11 12 Feb 1992

R A W D A T A

FILE	TEMP	40Ar	39Ar	38Ar	37Ar	36Ar regression	TRAP CURRENT	MANIFOLD OPTION
29249	930	143006	35468	3480	7072	50	200	EALL
	+	5252	962	32	16	5		
29250	1020	172889	42906	594	8509	25	200	EALL
	+	362	18	7	37	3		
29251	1100	242464	60064	754	11567	11	200	EALL
	+	230	136	17	37	9		
29252	1150	217269	53981	723	10667	3	200	EALL
	+	257	45	7	21	4		
29253	1220	304669	75590	1011	14706	22	200	EALL
	+	154	32	21	17	3		
29254	1270	243273	60446	822	11278	21	200	EALL
	+	80	105	7	25	7		
29255	1330	226843	55832	767	10262	13	200	EALL
	+	172	53	4	18	5		
29256	1450	92475	22592	320	4312	9	200	EALL
	+	122	5	12	15	7		
29257	1700	52573	12619	165	2085	18	200	EALL
	+	21	8	18	15	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
930	13	13315	202	476	0	14	1	5	0	8
1020	15	16030	244	576	0	17	1	7	0	3
1100	21	21802	342	806	0	23	1	9	-0	0
1150	19	20118	307	724	0	21	1	8	-0	-1
1220	27	27750	430	1014	0	29	1	11	-0	2
1270	22	21292	344	811	0	22	1	9	0	2
1330	20	19385	318	749	0	20	1	8	0	1
1450	8	8149	129	303	0	8	0	3	0	1
1700	4	3943	72	169	0	4	0	2	-0	3

All values in counts, corrected for mass discrimination

v 02/05/91 H89-174 KSPAR #3,4 RD81 00:55:12 12 Feb 1992

TEMP C	% TOT 39Ar	RAD YIELD	APP K/Ca	APP K/Cl	F	AGE (Ma)	precision intra-sample	precision intra-package	precision inter-packag
A 930	8.5	90.7	.90	28	3.646	32.09 +	1.35	1.35	1.36
B 1020	10.2	96.8	.91	4574	3.891	34.22 +	.20	.22	.28
C 1100	14.3	99.7	.93	0	4.015	35.30 +	.40	.41	.44
D 1150	12.9	100.0	.91	0	4.042	35.54 +	.20	.22	.28
E 1220	18.0	99.0	.92	0	3.978	34.98 +	.09	.13	.22
F 1270	14.4	98.5	.96	10278	3.951	34.75 +	.29	.30	.35
G 1330	13.3	99.3	.98	6696	4.022	35.37 +	.25	.27	.32
H 1450	5.4	98.1	.94	2928	4.003	35.20 +	.77	.78	.80
I 1700	3.0	90.6	1.09	0	3.763	33.11 +	.71	.72	.74
Total gas K/Ca =			.9						

Precisions are 1 sigma, measured in Ma. Measured 40/36 atm = 297.2 +.5
J = 0.004922 + 0.25% (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

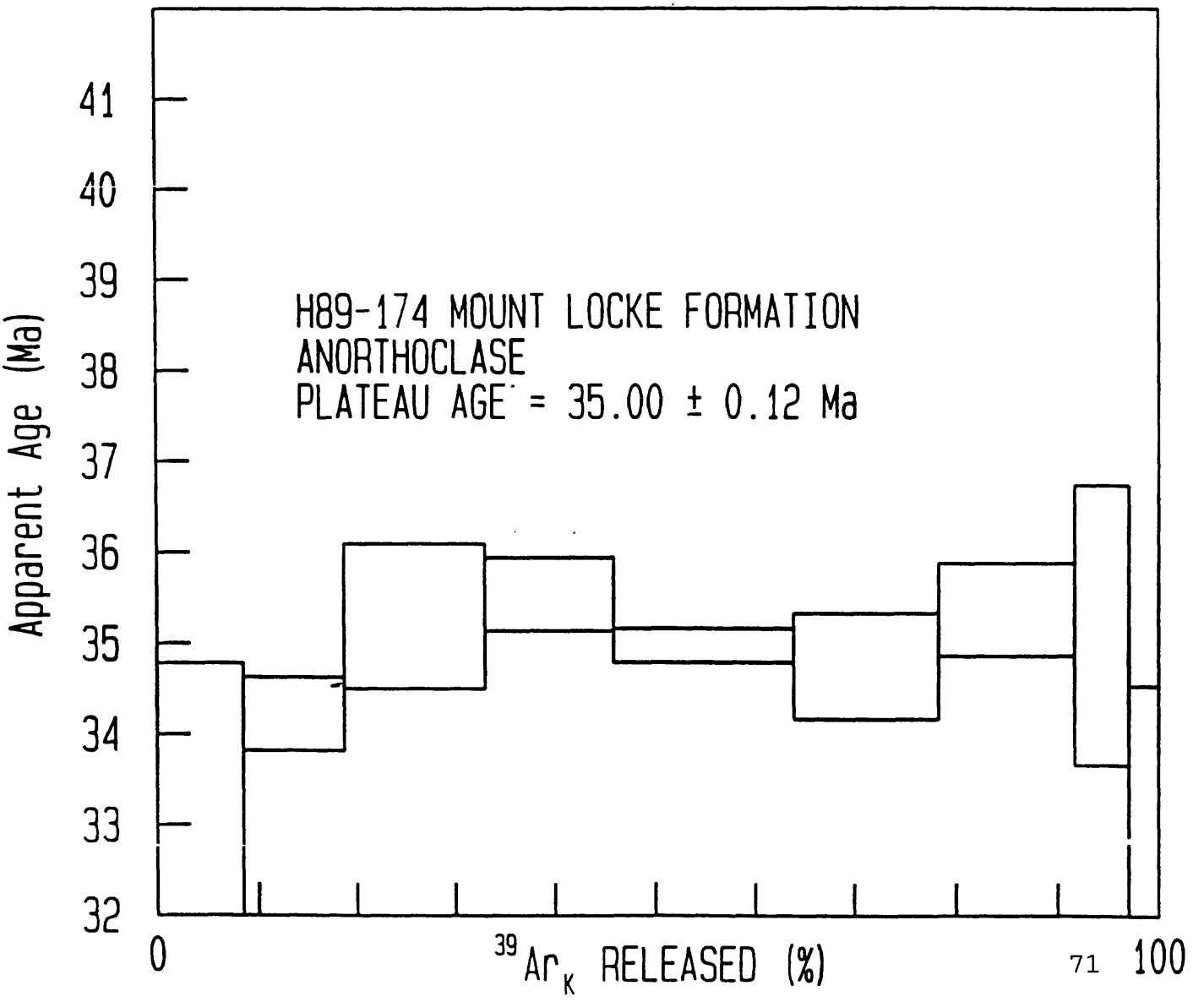
J = 0.004922 + 0.25% SAMPLE WT = 0.3998 g

TEMP C	Initial & radiogenic 40Ar	Potassium derived 39Ar	Chlorine derived 38Ar	Calcium derived 37Ar	Initial 36Ar	AGE* in Ma	**
930	2.856E-12	7.104E-13	6.045E-14	4.095E-13	9.002E-16	32.09 +	1.35
1020	3.453E-12	8.593E-13	***	4.929E-13	***	34.22 +	.20
1100	4.842E-12	1.203E-12	***	6.703E-13	***	35.30 +	.40
1150	4.339E-12	1.081E-12	***	6.184E-13	***	35.54 +	.20
1220	6.085E-12	1.514E-12	***	8.528E-13	***	34.98 +	.09
1270	4.859E-12	1.211E-12	***	6.542E-13	***	34.75 +	.29
1330	4.531E-12	1.118E-12	***	5.955E-13	***	35.37 +	.25
1450	1.847E-12	4.525E-13	***	2.503E-13	***	35.20 +	.77
1700	1.050E-12	2.527E-13	***	1.211E-13	***	33.11 +	.71
TOTAL GAS	3.386E-11	8.402E-12	6.196E-14	4.665E-12	2.344E-15	34.72	

51.1% of gas on plateau, steps 1220 through 1450 PLATEAU AGE = 35.00 + .1

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 02/05/91 01:03:19 12 Feb 1992 H89-174 KSPAR #3,4 RD81



v 02/05/91 (40/36in = 295.5)

v 02/05/91 H89-158B 17:56:04 7 Feb 1992

R A W D A T A

FILE	TEMP	40Ar	39Ar	38Ar	37Ar	36Ar regression	TRAP CURRENT	MANIFOLD OPTION
24713	750	111739	21263	450	66170	87	200	ALL
	+	52	14	2	25	6		
24714	950	304944	69784	876	231604	164	200	EALL
	+	154	50	15	210	3		
24715	1000	344493	80964	956	263675	182	200	EALL
	+	86	31	24	124	10		
24716	1050	255166	60267	739	195135	136	200	EALL
	+	212	19	29	128	8		
24717	1100	189981	44139	546	141331	97	200	EALL
	+	74	29	15	67	9		
24718	1150	147503	32934	403	104831	86	200	EALL
	+	138	19	18	46	13		
24719	1200	142563	30252	353	96348	31	200	EALL
	+	42	33	22	91	3		
24720	1250	137510	27461	344	86396	47	200	EALL
	+	64	17	8	71	7		
24721	1350	256892	39370	530	122924	129	200	EALL
	+	49	29	4	71	5		
24722	1450	973448	218849	2996	695092	460	200	EALL
	+	519	132	7	372	6		
24723	1650	327046	72234	903	231265	175	200	EALL
	+	120	39	7	191	7		
24724	1750	133209	26956	366	86367	55	200	EALL
	+	118	13	7	15	11		

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	75540	120	284	0	96	5	38	0	9
950	19	264631	395	932	0	335	16	132	-0	6
1000	22	301478	458	1082	0	382	18	150	-0	6
1050	16	223260	341	805	0	283	13	111	-0	5
1100	12	161809	250	590	0	205	10	80	-0	3
1150	9	120101	187	440	0	152	7	60	-0	5
1200	8	110456	171	404	0	140	7	55	-0	-4
1250	8	99113	156	367	0	125	6	49	-0	-0
1350	11	141112	223	526	0	178	8	70	0	11
1450	60	798469	1239	2924	0	1010	48	396	0	12
1650	20	265037	409	965	0	336	16	132	-0	6
1750	7	99345	153	360	0	126	6	49	0	1

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-packag
A	750	1.5	86.9	.08	298	4.575	39.31 +	.69	.70	.73
B	950	9.8	96.8	.07	0	4.238	36.45 +	.12	.15	.24
C	1000	11.3	97.2	.07	0	4.141	35.62 +	.32	.33	.38
D	1050	8.4	97.0	.07	0	4.116	35.41 +	.35	.36	.40
E	1100	6.2	97.3	.08	0	4.195	36.08 +	.50	.50	.54
F	1150	4.6	94.6	.08	0	4.246	36.52 +	1.02	1.02	1.04
G	1200	4.2	100.0	.08	0	4.954	42.53 +	.25	.27	.35
H	1250	3.8	100.0	.08	0	5.042	43.28 +	.60	.61	.65
I	1350	5.5	93.1	.08	11724	6.088	52.13 +	.30	.33	.42
J	1450	30.7	98.0	.08	11657	4.365	37.53 +	.08	.12	.23
K	1650	10.1	96.0	.08	0	4.352	37.42 +	.23	.25	.32
L	1750	3.8	98.5	.07	24486	4.878	41.89 +	1.02	1.03	1.05

Total gas K/Ca = .1

Precisions are 1 sigma, measured in Ma. Measured 40/36 atm = 297.2 +.5
J = 0.004816 + 0.25% (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

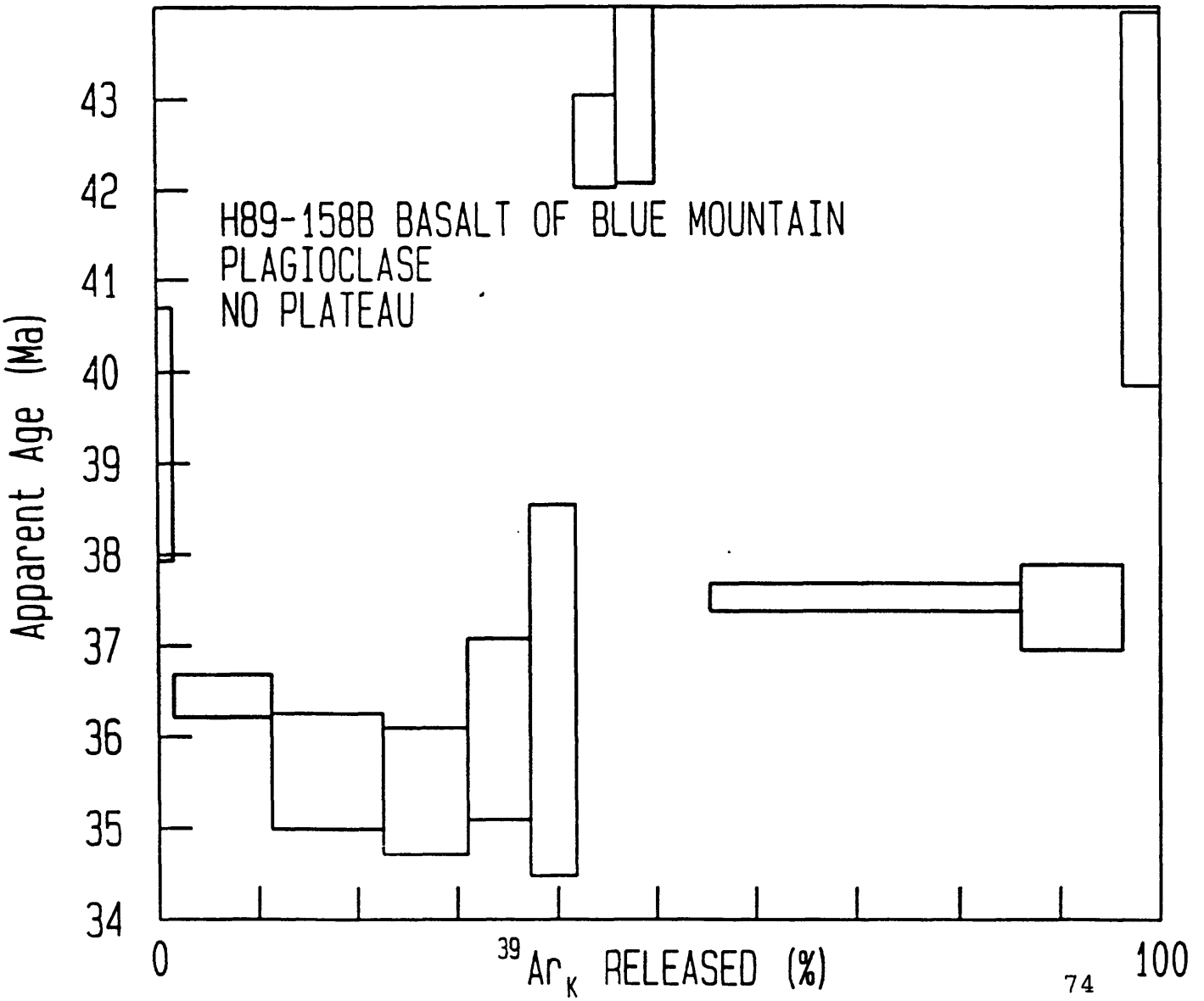
J = 0.004816 + 0.25% SAMPLE WT = 2.0022 g

TEMP C	Initial & radiogenic 40Ar	Potassium derived 39Ar	Chlorine derived 38Ar	Calcium derived 37Ar	Initial 36Ar	AGE* in Ma	**
750	1.116E-12	2.120E-13	1.720E-15	1.423E-12	4.947E-16	39.31 +	.69
950	6.091E-12	1.391E-12	***	9.968E-12	***	36.45 +	.12
1000	6.881E-12	1.614E-12	***	1.135E-11	***	35.62 +	.32
1050	5.096E-12	1.202E-12	***	8.404E-12	***	35.41 +	.35
1100	3.795E-12	8.802E-13	***	6.089E-12	***	36.08 +	.50
1150	2.946E-12	6.568E-13	***	4.518E-12	***	36.52 +	1.02
1200	2.848E-12	6.033E-13	***	4.154E-12	***	42.53 +	.25
1250	2.747E-12	5.476E-13	***	3.726E-12	***	43.28 +	.60
1350	5.133E-12	7.852E-13	***	5.304E-12	1.195E-15	52.13 +	.30
1450	1.944E-11	4.364E-12	9.060E-16	3.000E-11	1.337E-15	37.53 +	.08
1650	6.533E-12	1.440E-12	***	9.985E-12	8.930E-16	37.42 +	.23
1750	2.661E-12	5.375E-13	***	3.730E-12	***	41.89 +	1.02
TOTAL GAS	6.529E-11	1.423E-11	2.841E-15	9.865E-11	6.762E-15	38.22	

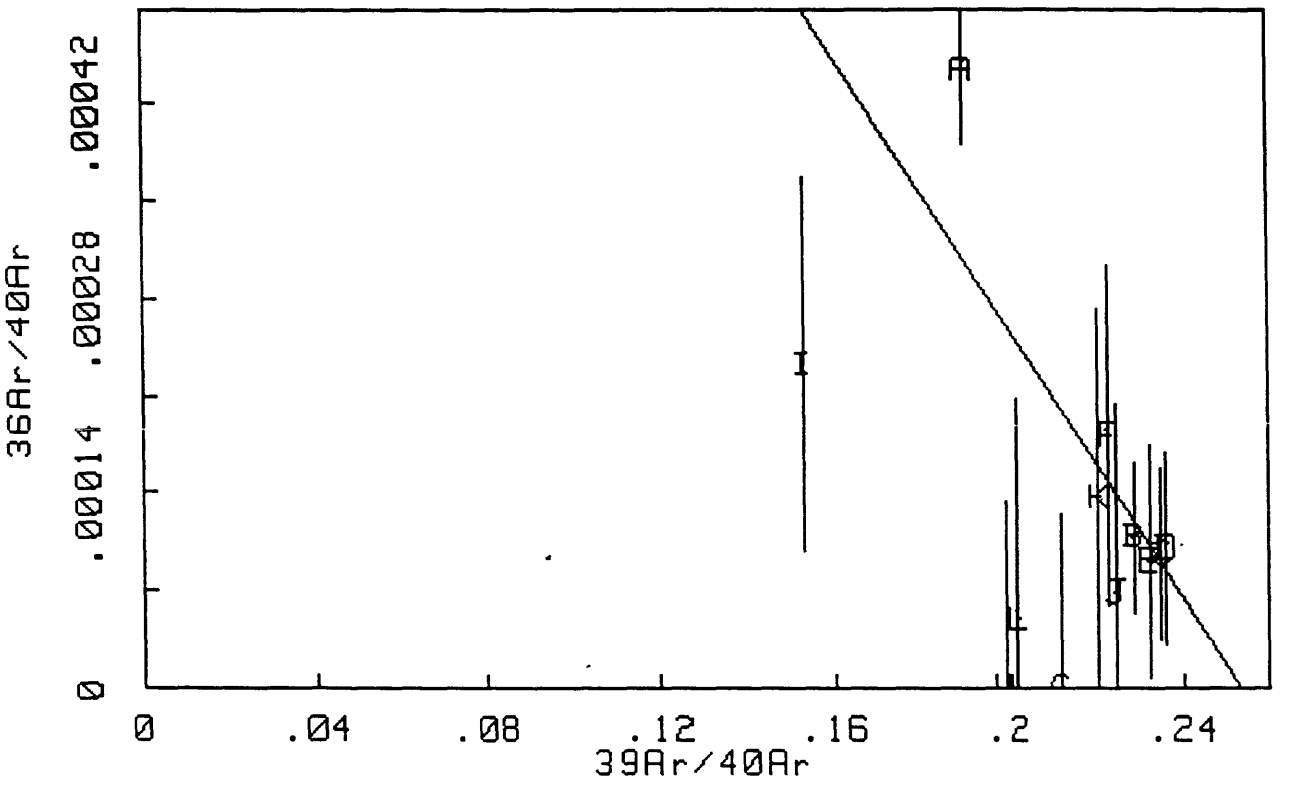
NO PLATEAU

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 02/05/91 18:00:50 7 Feb 1992 H89-158B RD 73



v 02/05/91 (40/36in = 295.5)



12 points regressed out of 12
Mean X = .217E+00 Mean Y = .172E-03 Slope = -.485E-02 + .114E-02
36/40 = .123E-02 + .250E-03 39/40 = .253E+00 + .109E-01
Fit parameters: SUMS = 18.895 MSWD = 1.889
40Ar/36Ar = 815.06 + 165.88 F = 3.957 + .171 AGE = 34.05 + 1.46 Ma

R A W D A T A

FILE	TEMP	40Ar	39Ar	38Ar	37Ar	36Ar regression	TRAP CURRENT	MANIFOLD OPTION
29261	930	461297	107686	1423	1411	82	200	EALL
	+	806	196	14	6	4		
29262	1020	365868	89400	1167	1180	9	200	EALL
	+	95	38	7	10	3		
29263	1100	331312	81117	1059	1092	11	200	EALL
	+	47	28	6	11	3		
29264	1150	308798	75807	988	1066	12	200	EALL
	+	163	84	11	10	4		
29265	1220	1235802	303641	3957	4176	6	200	EALL
	+	787	132	7	5	8		
29266	1270	1401377	341873	4436	4690	29	200	EALL
	+	606	176	12	6	3		
29267	1330	967353	234218	3033	3161	41	200	EALL
	+	388	124	19	4	5		
29268	1450	220165	52705	691	711	21	200	EALL
	+	158	48	8	22	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
930	38	2675	613	1446	0	3	0	1	-0	15
1020	32	2239	509	1200	0	2	0	1	-0	1
1100	29	2073	462	1089	0	2	0	1	-0	2
1150	27	2024	431	1018	0	2	0	1	-0	2
1220	109	7936	1728	4076	0	8	0	3	-0	1
1270	122	8918	1945	4589	0	9	0	4	-0	5
1330	84	6015	1333	3144	0	6	0	2	-0	7
1450	19	1354	300	707	0	1	0	1	-0	4

All values in counts, corrected for mass discrimination

v 02/05/91 H89-173 KSPAR #19,20 RD81 09:43:37 12 Feb 1992

	TEMP C	% TOT 39Ar	RAD YIELD	APP K/Ca	APP K/Cl	F	AGE (Ma)	precision intra-sample	precision intra-package	precision inter-packag
A	930	8.4	94.8	13.67	0	4.046	35.54 +	.11	.15	.23
B	1020	6.9	99.4	13.56	0	4.054	35.60 +	.10	.13	.22
C	1100	6.3	99.1	13.30	0	4.034	35.43 +	.11	.14	.23
D	1150	5.9	98.9	12.73	0	4.017	35.29 +	.15	.17	.25
E	1220	23.6	99.9	13.00	0	4.054	35.61 +	.07	.12	.21
F	1270	26.6	99.5	13.03	0	4.064	35.69 +	.03	.09	.20
G	1330	18.2	98.8	13.24	0	4.068	35.73 +	.06	.11	.21
H	1450	4.1	97.2	13.23	0	4.047	35.54 +	.29	.30	.35

Total gas K/Ca = 13.2

Precisions are 1 sigma, measured in Ma. Measured 40/36 atm = 297.2 +.5
J = 0.004917 + 0.25% (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

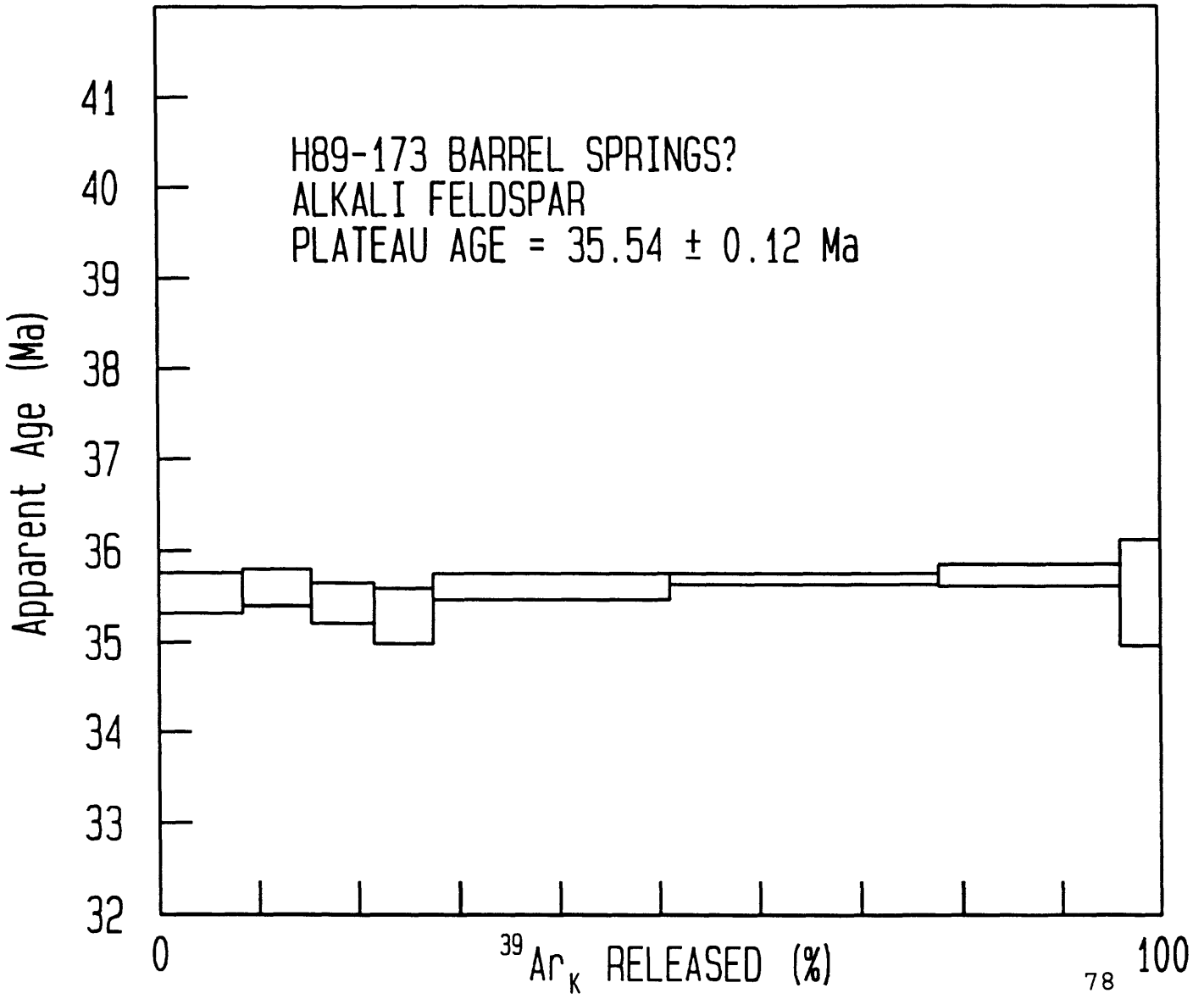
J = 0.004917 + 0.25% SAMPLE WT = 0.5052 g

TEMP C	Initial & radiogenic 40Ar	Potassium derived 39Ar	Chlorine derived 38Ar	Calcium derived 37Ar	Initial 36Ar	AGE* in Ma	**
930	9.214E-12	2.158E-12	***	8.207E-14	1.636E-15	35.54 +	.11
1020	7.307E-12	1.791E-12	***	6.867E-14	***	35.60 +	.10
1100	6.617E-12	1.625E-12	***	6.356E-14	***	35.43 +	.11
1150	6.167E-12	1.519E-12	***	6.206E-14	***	35.29 +	.15
1220	2.468E-11	6.084E-12	***	2.433E-13	***	35.61 +	.07
1270	2.799E-11	6.850E-12	***	2.733E-13	***	35.69 +	.03
1330	1.932E-11	4.693E-12	***	1.843E-13	***	35.73 +	.06
1450	4.397E-12	1.056E-12	***	4.149E-14	***	35.54 +	.29
TOTAL GAS	1.057E-10	2.577E-11	***	1.019E-12	4.007E-15	35.61	

51.1% of gas on plateau, steps 930 through 1220 PLATEAU AGE = 35.54 + .1
72.5% of gas on plateau, steps 1220 through 1450 PLATEAU AGE = 35.69 + .1

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 08/23/93 11:40:16 7 Dec 1993



v 08/23/93 (40/36in = 295.5)

R A W D A T A

FILE	TEMP	40Ar	39Ar	38Ar	37Ar	36Ar mean	TRAP CURRENT	MANIFOLD OPTION
19591:	750	927939	221867	2879	3617	137	200	ALL
	±	342	95	86	22	16		
19592:	900	2370190	587226	7571	9531	98	200	ALL
	±	829	197	38	18	17		
19593:	1075	2353823	586882	7564	9629	61	200	ALL
	±	792	157	38	11	4		
19594:	1120	1537739	383238	4976	6016	60	200	ALL
	±	456	165	50	13	16		
19595:	1150	1704182	424154	5496	6623	68	200	ALL
	±	677	123	55	11	4		
19596:	1180	2394353	594795	7647	9289	80	200	ALL
	±	656	172	38	10	4		
19597:	1225	4818773	1192882	15356	19724	118	200	ALL
	±	2160	394	46	28	12		
19598:	1300	2723372	671138	8600	11853	101	200	ALL
	±	965	140	43	22	7		
19599:	1450	85879	17105	230	291	67	200	ALL
	±	42	17	23	12	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	101	8997	1262	2977	0	9	0	3	-0	25
900	267	23722	3340	7879	0	22	1	9	-0	17
1075	267	23980	3338	7874	0	23	1	9	-0	10
1120	175	14996	2180	5142	0	14	1	6	-0	10
1150	193	16517	2412	5691	0	16	1	6	-0	12
1180	271	23187	3383	7980	0	22	1	9	-0	13
1225	544	49261	6784	16005	0	47	2	18	-0	19
1300	306	29621	3817	9005	0	28	1	11	-0	17
1450	8	728	97	229	0	1	0	0	0	12

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	4.7	95.7	9.14	0	3.993	35.65	±	.19	.21	.28
B	900	12.5	98.9	9.17	0	3.981	35.55	±	.08	.12	.22
C	1075	12.5	99.3	9.07	0	3.974	35.49	±	.03	.09	.20
D	1120	8.2	98.9	9.47	0	3.960	35.36	±	.11	.14	.23
E	1150	9.1	98.9	9.52	0	3.964	35.40	±	.03	.09	.20
F	1180	12.7	99.1	9.51	0	3.979	35.53	±	.02	.09	.20
G	1225	25.5	99.4	8.98	0	4.004	35.75	±	.03	.10	.20
H	1300	14.3	99.0	8.40	0	4.008	35.78	±	.03	.10	.20
I	1450	.4	77.0	8.71	3081	3.855	34.44	±	1.41	1.42	1.43

Total gas K/Ca = 9.1

Precisions are 1 sigma, measured in Ma. Measured 40/36 atm = 296.5 ±.5
J = 0.004999 ± 0.25% (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 = 6.000E-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±4.0E-03

BS-4

J = 0.004999 ± 0.25% SAMPLE WT = 0.3300 g

TEMP C	Initial & radiogenic 40Ar	Potassium derived 39Ar	Chlorine derived 38Ar	Calcium derived 37Ar	Initial 36Ar	AGE* in Ma	**
750	5.560E-12	1.333E-12	***	7.587E-14	8.066E-16	35.65 ±	.21
900	1.420E-11	3.528E-12	***	2.000E-13	5.350E-16	35.55 ±	.12
1075	1.410E-11	3.526E-12	***	2.022E-13	3.117E-16	35.49 ±	.09
1120	9.213E-12	2.302E-12	***	1.264E-13	3.280E-16	35.36 ±	.14
1150	1.021E-11	2.548E-12	***	1.392E-13	3.740E-16	35.40 ±	.09
1180	1.435E-11	3.573E-12	***	1.954E-13	4.297E-16	35.53 ±	.09
1225	2.887E-11	7.166E-12	***	4.150E-13	6.019E-16	35.75 ±	.10
1300	1.632E-11	4.032E-12	***	2.495E-13	5.395E-16	35.78 ±	.10
1450	5.147E-13	1.028E-13	***	6.132E-15	4.011E-16	34.44 ±	1.42
TOTAL GAS	1.133E-10	2.811E-11	***	1.610E-12	4.327E-15	35.60	

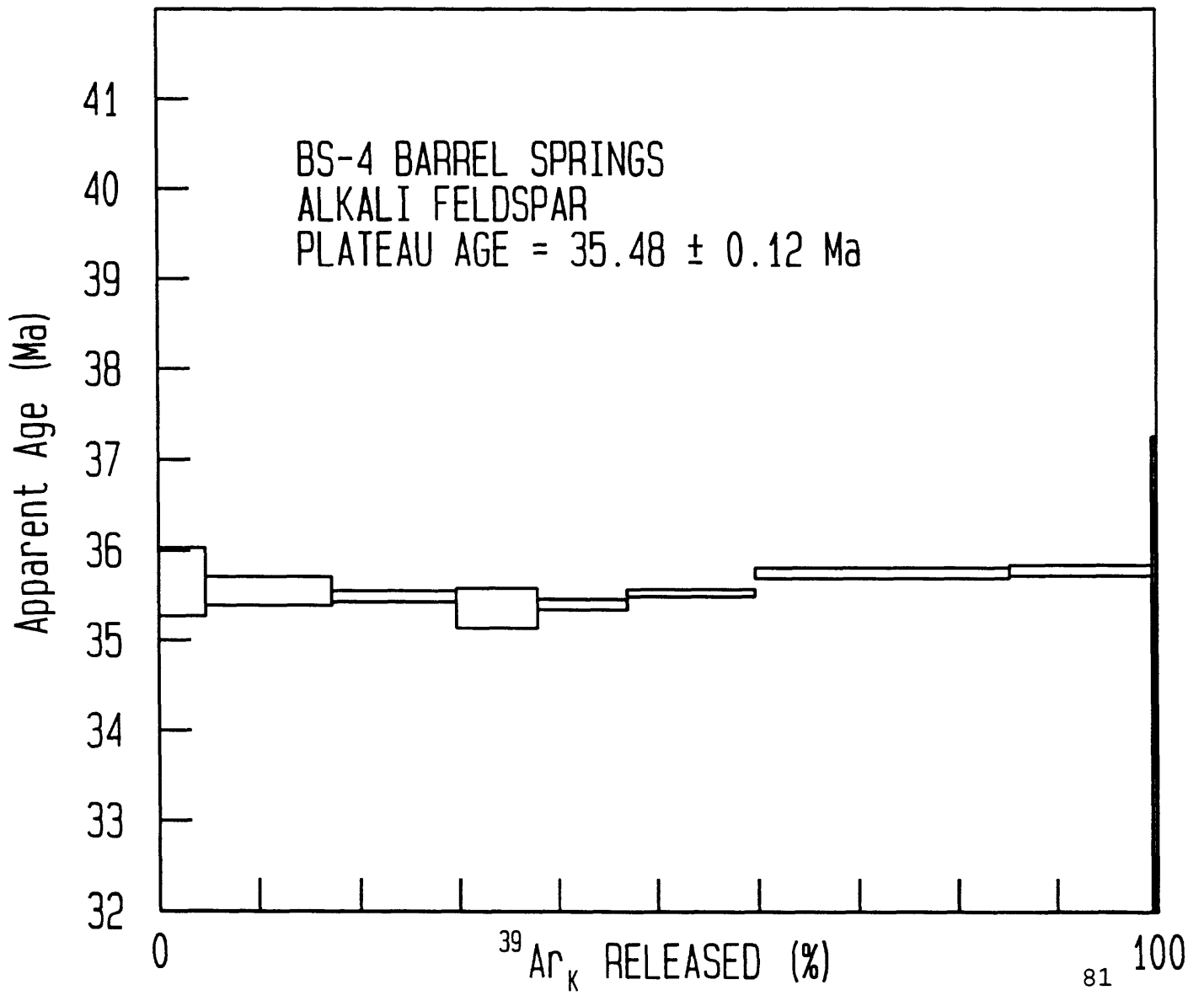
K/Ca = 9.1

59.8% of gas on plateau, steps 750 through 1180 PLATEAU AGE = 35.48 ± .12

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 2/18/89

v 08/23/93 11:52:59 7 Dec 1993



v 08/23/93 (40/36in = 295.5)

J87-67

R A W D A T A

FILE	TEMP	40Ar	39Ar	38Ar	37Ar	36Ar mean	TRAP CURRENT	MANIFOLD OPTION
19582:	750	306893	67537	926	1193	105	200	ALL
	±	260	41	46	18	3		
19583:	900	1229031	295677	3829	4627	62	200	ALL
	±	370	115	38	11	15		
19584:	1075	3493545	846342	10913	12678	77	200	ALL
	±	1324	259	33	13	12		
19585:	1120	1951089	472840	6098	6979	45	200	ALL
	±	600	123	30	14	9		
19586:	1150	1541023	372848	4804	5517	44	200	ALL
	±	428	107	48	13	13		
19587:	1180	1505860	364365	4679	5416	35	200	ALL
	±	446	100	47	9	6		
19589:	1300	2598579	626194	8089	9340	58	200	SPLIT 1
	±	728	162	40	9	21		
19590:	1450	456053	107910	1380	1572	35	200	ALL
	±	61	28	41	6	10		

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	31	2948	384	906	0	3	0	1	0	19
900	134	11437	1682	3967	0	11	1	4	-0	11
1075	384	31364	4813	11355	0	30	1	12	-0	12
1120	215	17281	2689	6344	0	16	1	6	-0	7
1150	169	13669	2120	5002	0	13	1	5	-0	7
1180	166	13427	2072	4889	0	13	1	5	-0	6
1300	285	23180	3561	8402	0	22	1	9	-0	9
1450	49	3903	614	1448	0	4	0	1	-0	6

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	1.4	90.0	8.47	3987	4.078	35.56	±	.13	.16	.24
B	900	6.2	98.6	9.56	0	4.088	35.64	±	.14	.16	.24
C	1075	17.7	99.4	9.98	0	4.094	35.69	±	.04	.10	.21
D	1120	9.9	99.4	10.12	0	4.091	35.67	±	.05	.10	.21
E	1150	7.8	99.3	10.09	0	4.092	35.67	±	.09	.13	.22
F	1180	7.6	99.4	10.04	0	4.097	35.72	±	.05	.10	.21
G	1300	47.1	99.4	10.00	0	4.116	35.88	±	.09	.13	.22
H	1450	2.3	97.8	10.24	0	4.124	35.95	±	.24	.26	.32

Total gas K/Ca = 10.0

Precisions are 1 sigma, measured in Ma. Measured 40/36 atm = 296.5 ±.5
J = 0.004881 ± 0.25% (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 = 6.000E-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±3.8E-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 2/18/89

J87-67

J = 0.004881 ± 0.25% SAMPLE WT = 0.3300 g

TEMP C	Initial & radiogenic 40Ar	Potassium derived 39Ar	Chlorine derived 38Ar	Calcium derived 37Ar	Initial 36Ar	AGE* in Ma	**
750	1.839E-12	4.057E-13	2.463E-16	2.491E-14	6.243E-16	35.56 ±	.16
900	7.364E-12	1.776E-12	***	9.663E-14	3.496E-16	35.64 ±	.16
1075	2.093E-11	5.084E-12	***	2.649E-13	3.939E-16	35.69 ±	.10
1120	1.169E-11	2.841E-12	***	1.459E-13	***	35.67 ±	.10
1150	9.233E-12	2.240E-12	***	1.154E-13	***	35.67 ±	.13
1180	9.023E-12	2.189E-12	***	1.133E-13	***	35.72 ±	.10
1300	5.605E-11	1.354E-11	***	7.042E-13	1.068E-15	35.88 ±	.13
1450	2.733E-12	6.483E-13	***	3.293E-14	***	35.95 ±	.26
TOTAL GAS	1.189E-10	2.873E-11	2.463E-16	1.498E-12	3.282E-15	35.78	

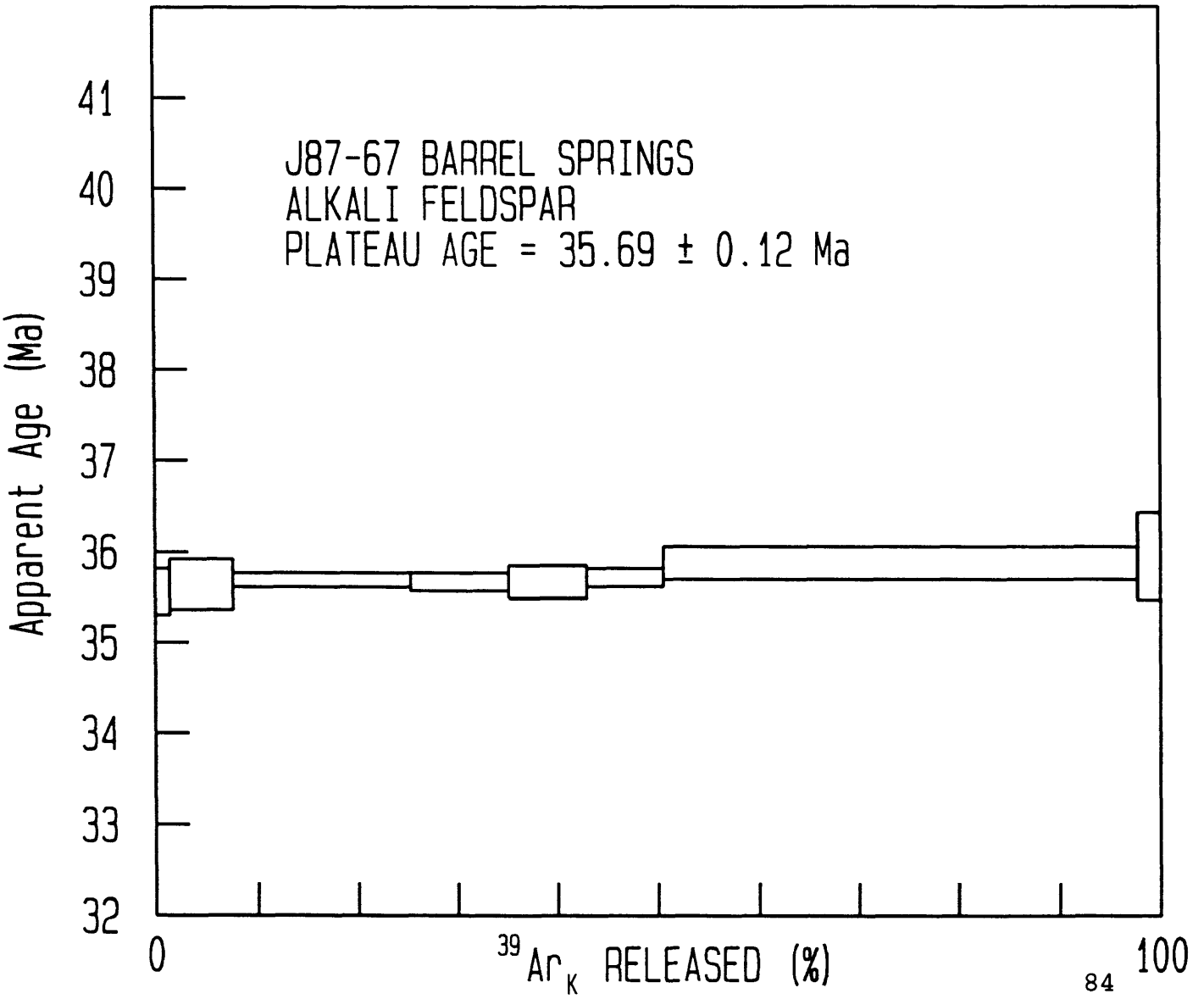
K/Ca = 10.0

50.6% of gas on plateau, steps 750 through 1180 PLATEAU AGE = 35.69 ± .12
98.6% of gas on plateau, steps 900 through 1450 PLATEAU AGE = 35.71 ± .13

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 2/18/89

v 08/23/93 12:10:58 7 Dec 1993



v 08/23/93 (40/36in = 295.5)

BS-1

R A W D A T A

FILE	TEMP	40Ar	39Ar	38Ar	37Ar	36Ar mean	TRAP CURRENT	MANIFOLD OPTION
19687:	750	162360	33636	452	463	87	200	ALL
	±	32	29	45	15	7		
19688:	900	696997	171324	2199	2212	52	200	ALL
	±	163	38	66	19	13		
19689:	1075	2554446	637234	8239	8169	81	200	ALL
	±	1235	387	41	12	11		
19690:	1120	1315676	328186	4238	4142	45	200	ALL
	±	243	62	42	7	15		
19691:	1180	1354098	337584	4360	4234	36	200	ALL
	±	542	106	44	14	11		
19692:	1220	1029429	256616	3309	3222	34	200	ALL
	±	244	35	33	5	5		
19693:	1300	2934182	732383	9459	9147	70	200	ALL
	±	1158	455	47	10	9		
19694:	1450	2055546	510085	6550	6514	33	100	ALL
	±	929	79	33	16	8		

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	K-derived 38Ar	K-derived 37Ar	Ca-derived 39Ar	Ca-derived 38Ar	Ca-derived 36Ar	Cl-der 36Ar	Initial 38Ar
750	16	1311	191	451	0	1	0	0	0	16
900	84	6272	974	2299	0	6	0	2	-0	9
1075	313	23174	3624	8550	0	21	1	8	-0	14
1120	161	11759	1867	4403	0	11	1	4	-0	8
1180	166	12027	1920	4530	0	11	1	4	-0	6
1220	126	9158	1459	3443	0	8	0	3	-0	6
1300	360	26021	4165	9827	0	24	1	9	-0	11
1450	251	18541	2901	6844	0	17	1	7	-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)		precision intra-sample	precision intra-package	precision inter-package
A	750	.7	84.2	9.85	4575	4.054	36.44	±	.54	.55	.58
B	900	3.8	97.9	10.49	0	3.971	35.70	±	.20	.22	.28
C	1075	14.0	99.2	10.56	0	3.964	35.64	±	.05	.10	.21
D	1120	7.2	99.1	10.72	0	3.961	35.61	±	.12	.15	.23
E	1180	7.4	99.3	10.78	0	3.972	35.71	±	.09	.13	.22
F	1220	5.7	99.1	10.77	0	3.966	35.65	±	.05	.10	.21
G	1300	16.1	99.4	10.82	0	3.971	35.70	±	.04	.10	.21
H	1450	45.0	99.6	10.57	0	4.004	35.99	±	.05	.10	.21

Total gas K/Ca = 10.6

Precisions are 1 sigma, measured in Ma. Measured 40/36 atm = 296.5 ±.5
J = 0.005033 ± 0.25% (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 = 6.000E-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±4.0E-03

BS-1

J = 0.005033 ± 0.25% SAMPLE WT = 0.3299 g

TEMP C	Initial & radiogenic 40Ar	Potassium derived 39Ar	Chlorine derived 38Ar	Calcium derived 37Ar	Initial 36Ar	AGE* in Ma	**
750	9.730E-13	2.021E-13	***	1.067E-14	5.203E-16	36.44 ±	.55
900	4.176E-12	1.029E-12	***	5.103E-14	2.990E-16	35.70 ±	.22
1075	1.530E-11	3.828E-12	***	1.885E-13	4.351E-16	35.64 ±	.10
1120	7.883E-12	1.972E-12	***	9.565E-14	2.440E-16	35.61 ±	.15
1180	8.113E-12	2.028E-12	***	9.781E-14	***	35.71 ±	.13
1220	6.168E-12	1.542E-12	***	7.447E-14	***	35.65 ±	.10
1300	1.758E-11	4.400E-12	***	2.115E-13	3.658E-16	35.70 ±	.10
1450	4.926E-11	1.226E-11	***	6.028E-13	***	35.99 ±	.10
TOTAL GAS	1.095E-10	2.726E-11	***	1.333E-12	2.876E-15	35.82	

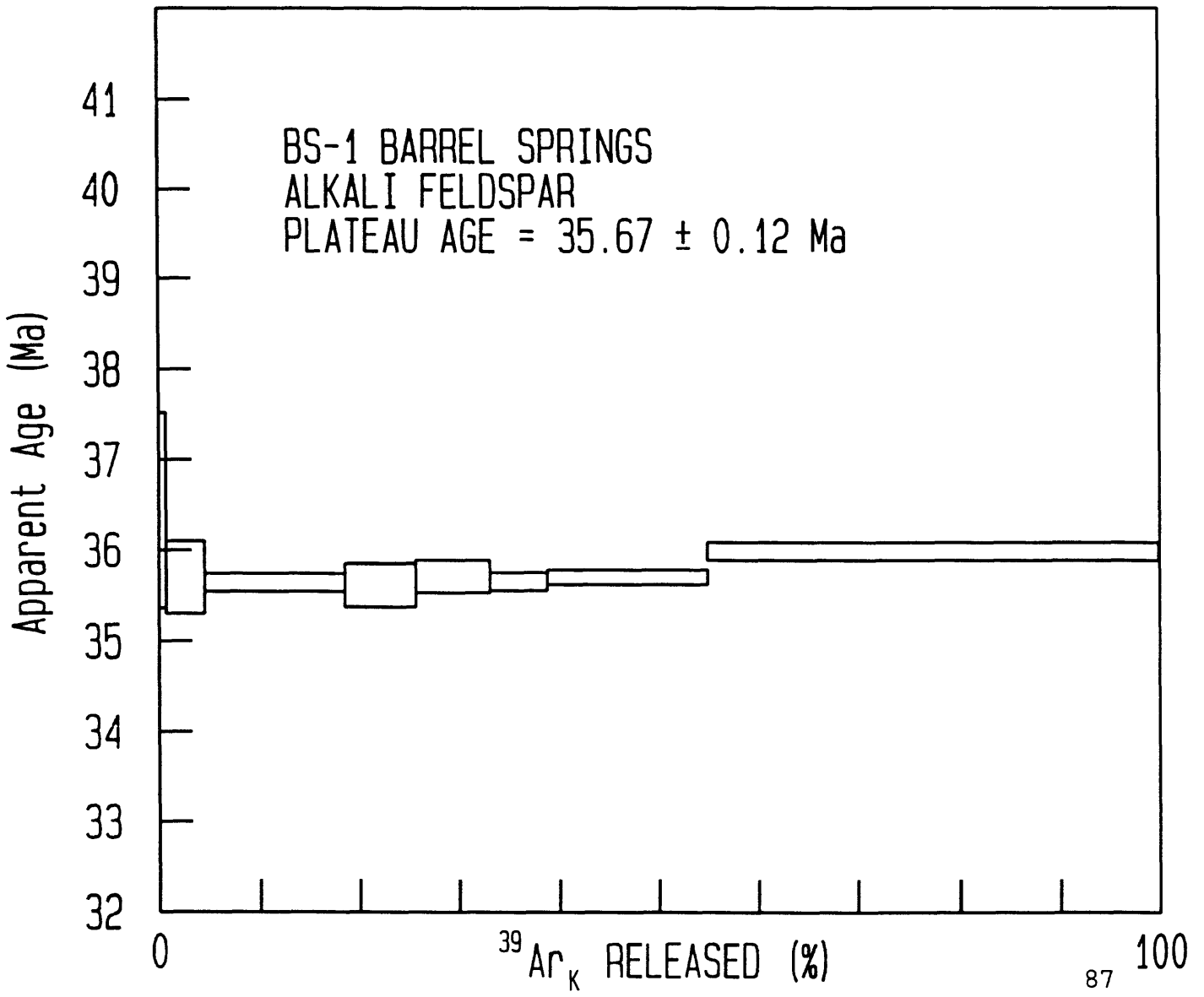
K/Ca = 10.6

55.0% of gas on plateau, steps 750 through 1300 PLATEAU AGE = 35.67 ± .12

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 2/18/89

v 08/23/93 12:29:17 7 Dec 1993



v 08/23/93 (40/36in = 295.5)

J-87-65 K-SPAR #21RD64

R A W D A T A

FILE	TEMP	40Ar	39Ar	38Ar	37Ar	36Ar *	TRAP CURRENT	MANIFOLD OPTION
23603	1120	1162831	289531	3763	171	88	200	ALL
	+	225	221	5	5	7		
23604	1190	1686738	422447	5424	246	88	200	ALL
	+	184	330	11	10	1		
23605	1240	1538775	384996	4946	223	77	200	ALL
	+	738	246	17	11	9		
23606	1300	1832434	458002	5919	230	84	200	ALL
	+	1212	280	7	7	2		
23607	1450	1402332	348461	4495	168	92	200	ALL
	+	547	120	8	12	8		
23608	1750	298333	68360	839	39	88	200	ALL
	+	120	44	14	16	6		

* 36Ar peak values less than 20 are means those above 20 are from linear regressions

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
1120	486	16031	1649	3889	0	11	1	4	-0	16
1190	710	22994	2405	5675	0	16	1	6	-0	15
1240	647	20922	2192	5172	0	14	1	6	-0	13
1300	770	21585	2608	6153	0	15	1	6	-0	15
1450	586	15735	1984	4681	0	11	1	4	-0	16
1750	115	3614	389	918	0	2	0	1	-0	16

All values in counts, corrected for mass discrimination

J-87-65 K-SPAR #21RD64

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 1120	14.7	97.9	9.29	0	3.916	35.58 +	.07	.11	.21
B 1190	21.4	98.6	9.45	0	3.920	35.62 +	.01	.09	.20
C 1240	19.5	98.6	9.47	0	3.926	35.68 +	.07	.11	.21
D 1300	23.2	98.7	10.92	0	3.935	35.75 +	.03	.09	.20
E 1450	17.7	98.1	11.39	0	3.934	35.75 +	.06	.11	.21
F 1750	3.5	91.3	9.73	0	3.970	36.07 +	.25	.27	.32

Total gas K/Ca = 10.1

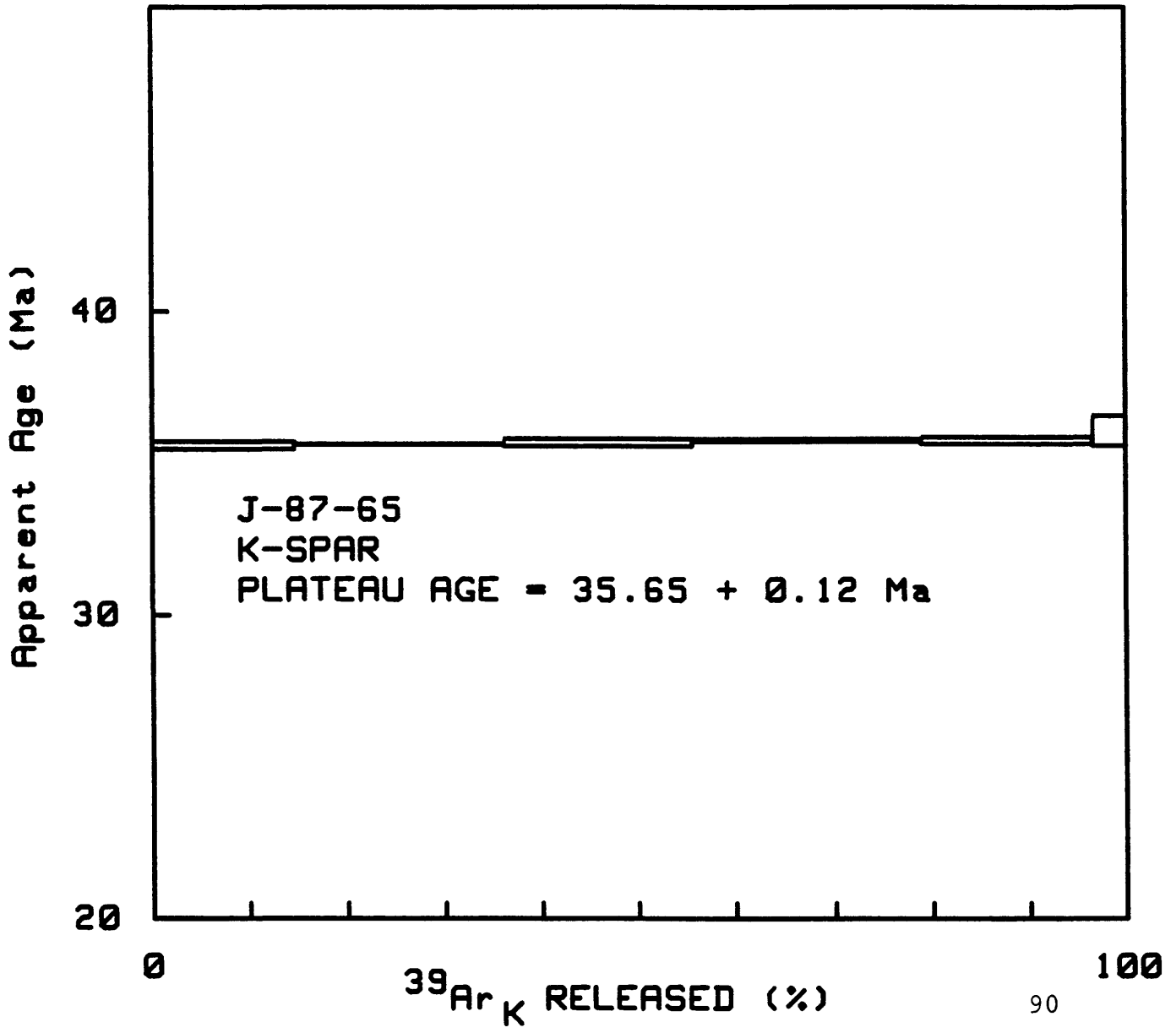
Precisions are 1 sigma, measured in Ma. Measured 40/36 atm = 296.5 +.5
J = 0.005087 + 0.25% (intra-package) + 0.50% (inter-package)
Trap current factors- 40: 5.66 100: 2.62 200: 1
Manifold factors- ALL: 1 SPLIT 1: 3.3 SPLIT 2: 10.89 SPLIT 3: 35.937
EALL: 2 ESPLIT 1: 6.6 ESPLIT 2: 21.78
Sensitivity = 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 = 0.005087 + 0.25% SAMPLE WT = 0.2523 g

TEMP C	Initial & radiogenic 40Ar	Potassium derived 39Ar	Chlorine derived 38Ar	Calcium derived 37Ar	Initial 36Ar	AGE* in Ma	**
1120	1.161E-11	2.903E-12	***	1.624E-13	8.356E-16	35.58 +	.07
1190	1.684E-11	4.235E-12	***	2.330E-13	8.247E-16	35.62 +	.01
1240	1.537E-11	3.860E-12	***	2.120E-13	7.166E-16	35.68 +	.07
1300	1.830E-11	4.591E-12	***	2.187E-13	7.874E-16	35.75 +	.03
1450	1.400E-11	3.493E-12	***	1.594E-13	8.824E-16	35.75 +	.06
1750	2.979E-12	6.853E-13	***	3.662E-14	8.767E-16	36.07 +	.25
TOTAL GAS	7.910E-11	1.977E-11	***	1.022E-12	4.923E-15	35.69	

100.0% of gas on plateau, steps 1120 through 1750 PLATEAU AGE = 35.65 + .12

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


Apparent Age (Ma)
40
30
20
J-87-65
K-SPAR
PLATEAU AGE = 35.65 + 0.12 Ma
0
100
$^{39}Ar_K$ RELEASED (%)

v 06/13/92 J87-65 KSPAR #41,42 RD75 14:24:25 24 Feb 1993

R A W D A T A

FILE	TEMP	40Ar	39Ar	38Ar	37Ar	36Ar *	TRAP CURRENT	MANIFOLD OPTION
27970	970	667803	168460	2215	80	65	200	EALL
	▪	1086	401	5	4	3		
27971	1090	956013	245071	3182	95	35	200	EALL
	▪	798	316	9	7	11		
27972	1170	955209	245126	3175	78	13	200	EALL
	▪	190	131	4	11	6		
27973	1200	614403	157578	2018	54	18	200	EALL
	▪	618	298	14	7	8		
27974	1230	507916	129971	1674	37	10	200	EALL
	▪	81	26	9	7	5		
27975	1270	557832	142497	1835	45	17	200	EALL
	▪	458	129	10	9	7		
27976	1400	694679	177039	2280	60	30	200	EALL
	▪	1243	361	14	19	12		

* 36Ar peak values less than 10 are means those above 10 are from linear regressions

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
970	313	12087	960	2265	0	8	0	3	-0	12
1090	455	14338	1397	3295	0	10	0	4	-0	6
1170	455	11798	1397	3295	0	8	0	3	-0	2
1200	293	8175	898	2118	0	6	0	2	-0	3
1230	241	5519	741	1747	0	4	0	1	-0	2
1270	265	6776	812	1916	0	5	0	2	-0	3
1400	329	9108	1009	2380	0	6	0	2	-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)	precision intra-sample	precision intra-package	precision inter-package
A	970	13.3	97.2	7.19	0	3.837	35.27 ▪	.08	.12	.21
B	1090	19.4	99.0	8.82	0	3.845	35.35 ▪	.12	.15	.23
C	1170	19.4	99.7	10.72	0	3.867	35.54 ▪	.07	.11	.21
D	1200	12.4	99.2	9.95	0	3.851	35.40 ▪	.14	.17	.24
E	1230	10.3	99.5	12.15	0	3.870	35.57 ▪	.11	.14	.23
F	1270	11.3	99.2	10.85	0	3.865	35.53 ▪	.13	.16	.24
G	1400	14.0	98.8	10.03	0	3.859	35.48 ▪	.19	.21	.28
Total gas K/Ca =				9.9						

Precisions are 1 sigma, measured in Ma. Measured 40/36 atm = 297.2 ▪.5
J = 0.005146 ▪ 0.25% (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

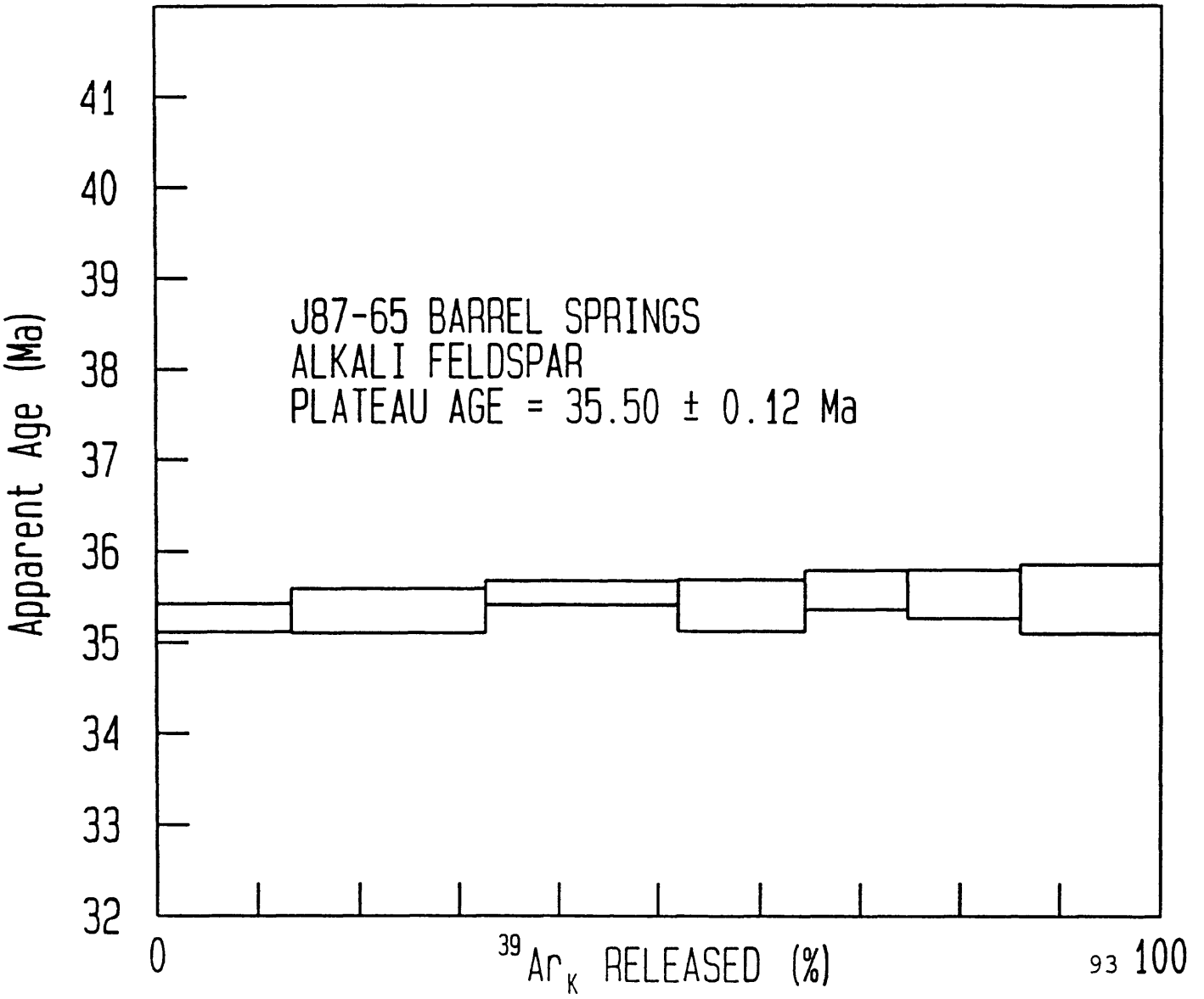
J = 0.005146 ▪ 0.25% SAMPLE WT = 0.5011 g

TEMP C	Initial & radiogenic 40Ar	Potassium derived 39Ar	Chlorine derived 38Ar	Calcium derived 37Ar	Initial 36Ar	AGE* in Ma	**
970	1.334E-11	3.380E-12	***	2.444E-13	1.246E-15	35.27 ▪	.08
1090	1.909E-11	4.917E-12	***	2.899E-13	***	35.35 ▪	.12
1170	1.908E-11	4.919E-12	***	2.385E-13	***	35.54 ▪	.07
1200	1.227E-11	3.162E-12	***	1.653E-13	***	35.40 ▪	.14
1230	1.014E-11	2.608E-12	***	1.ĭ16E-13	***	35.57 ▪	.11
1270	1.114E-11	2.859E-12	***	1.370E-13	***	35.53 ▪	.13
1400	1.387E-11	3.552E-12	***	1.841E-13	***	35.48 ▪	.19
TOTAL GAS	9.893E-11	2.540E-11	***	1.371E-12	3.417E-15	35.44	

86.7% of gas on plateau, steps 1090 through 1400 PLATEAU AGE = 35.50 + .12

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 14:26:47 24 Feb 1993 J87-65 KSPAR #41,42 RD75



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

v 06/13/92 J87-65 #24 RD92 KSPAR 21:20:32 23 Feb 1993

R A W D A T A

FILE	TEMP	40Ar	39Ar	38Ar	37Ar	36Ar *	TRAP CURRENT	MANIFOLD OPTION
35250	950	371614	87026	1135	543	101	200	EALL
	▪	299	89	3	15	4		
35251	1050	491322	123287	1564	762	22	200	EALL
	▪	218	62	4	8	6		
35252	1100	466747	117109	1498	681	19	200	EALL
	▪	210	102	7	9	9		
35253	1160	533443	134614	1717	793	20	200	EALL
	▪	119	89	5	10	6		
35254	1200	368218	92882	1190	525	14	200	EALL
	▪	108	63	12	8	5		
35255	1240	449801	113260	1452	637	12	200	EALL
	▪	151	74	14	5	6		
35256	1300	168370	41866	535	229	15	200	EALL
	▪	34	18	35	5	6		

* 36Ar peak values less than 10 are means those above 10 are from linear regressions

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
950	71	4376	495	1169	0	3	0	1	-0	19
1050	100	6135	702	1656	0	5	0	2	-0	4
1100	95	5486	667	1573	0	4	0	2	-0	3
1160	109	6392	766	1808	0	5	0	2	-0	3
1200	76	4237	529	1247	0	3	0	1	-0	2
1240	92	5144	645	1521	0	4	0	2	-0	2
1300	34	1847	238	562	0	1	0	1	-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 950	12.3	92.0	9.18	0	3.914	35.62 ▪	.11	.15	.23
B 1050	17.4	98.8	9.27	0	3.923	35.70 ▪	.12	.15	.24
C 1100	16.5	98.9	9.85	0	3.927	35.74 ▪	.21	.23	.29
D 1160	19.0	99.0	9.72	0	3.908	35.56 ▪	.12	.15	.24
E 1200	13.1	99.0	10.12	0	3.910	35.58 ▪	.15	.18	.25
F 1240	16.0	99.3	10.16	0	3.930	35.77 ▪	.14	.17	.25
G 1300	5.9	97.4	10.47	0	3.901	35.51 ▪	.35	.36	.41
Total gas K/Ca =			9.8						

Precisions are 1 sigma, measured in Ma. Measured 40/36 atm = 297.3 ▪.5
J = 0.005095 ▪ 0.25% (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: 2.07 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

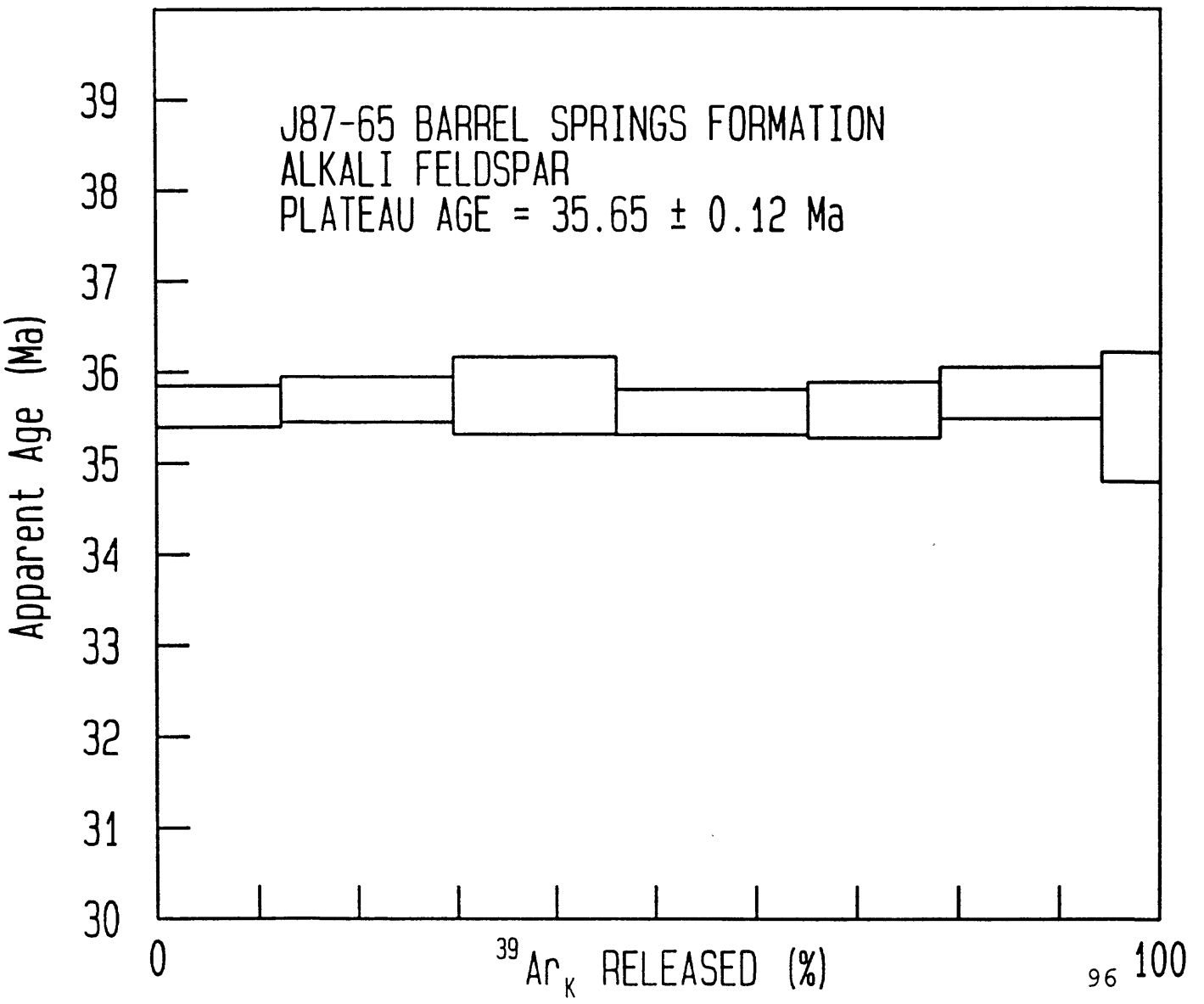
J = 0.005095 ▪ 0.25% SAMPLE WT = 0.2497 g

TEMP C	Initial & radiogenic 40Ar	Potassium derived 39Ar	Chlorine derived 38Ar	Calcium derived 37Ar	Initial 36Ar	AGE* in Ma	**
950	1.133E-11	2.663E-12	***	1.509E-13	3.068E-15	35.62 ▪	.11
1050	1.498E-11	3.773E-12	***	2.115E-13	***	35.70 ▪	.12
1100	1.423E-11	3.584E-12	***	1.892E-13	***	35.74 ▪	.21
1160	1.626E-11	4.120E-12	***	2.204E-13	***	35.56 ▪	.12
1200	1.123E-11	2.842E-12	***	1.461E-13	***	35.58 ▪	.15
1240	1.371E-11	3.466E-12	***	1.773E-13	***	35.77 ▪	.14
1300	5.133E-12	1.281E-12	***	6.365E-14	***	35.51 ▪	.35
TOTAL GAS	8.688E-11	2.173E-11	***	1.159E-12	5.915E-15	35.66	

100.0% of gas on plateau, steps 950 through 1300 PLATEAU AGE = 35.65 + .12

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 21:23:17 23 Feb 1993 J87-65 #24 RD92 KSPAR



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

v 02/05/91 H89-23 15:05:05 7 Feb 1992

R A W D A T A

FILE	TEMP	40Ar	39Ar	38Ar	37Ar	36Ar regression	TRAP CURRENT	MANIFOLD OPTION
24496	1050	1011463	219346	2873	4322	26	200	EALL
	+	709	96	3	12	3		
24497	1100	698953	161564	2137	3249	16	200	EALL
	+	289	105	7	4	10		
24498	1140	484449	113931	1497	2326	6	200	EALL
	+	264	75	5	7	7		
24499	1190	489350	115893	1547	2347	13	200	EALL
	+	73	43	21	8	8		
24500	1250	983820	234082	3104	4870	18	200	EALL
	+	793	181	19	10	8		
24501	1340	2143302	509435	6725	10694	35	200	EALL
	+	484	216	7	7	4		
24502	1650	1895834	430352	5673	9049	61	200	EALL
	+	1010	421	14	15	11		

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
1050	35	2494	1248	2944	0	5	0	2	-0	5
1100	26	1877	919	2168	0	3	0	1	-0	3
1140	18	1345	648	1529	0	2	0	1	-0	1
1190	18	1359	659	1555	0	3	0	1	-0	2
1250	37	2822	1332	3142	0	5	0	2	-0	3
1340	81	6202	2898	6837	0	11	1	4	-0	6
1650	69	5253	2448	5776	0	10	0	4	-0	11

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-packag
A 1050	12.3	99.3	16.69	0	4.565	39.23 +	.05	.11	.22
B 1100	9.1	99.4	16.34	0	4.287	36.87 +	.16	.19	.26
C 1140	6.4	99.7	16.09	0	4.227	36.35 +	.15	.18	.26
D 1190	6.5	99.3	16.22	0	4.180	35.96 +	.17	.20	.27
E 1250	13.1	99.5	15.78	0	4.171	35.88 +	.09	.12	.22
F 1340	28.5	99.6	15.64	0	4.177	35.93 +	.02	.09	.20
G 1650	24.1	99.1	15.60	0	4.353	37.43 +	.07	.11	.22
Total gas K/Ca =			15.9						

Precisions are 1 sigma, measured in Ma. Measured 40/36 atm = 297.2 +.5
J = 0.004816 + 0.25% (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 02/05/91 15:05:09 7 Feb 1992

H89-23

J = 0.004816 + 0.25% SAMPLE WT = 0.4545 g

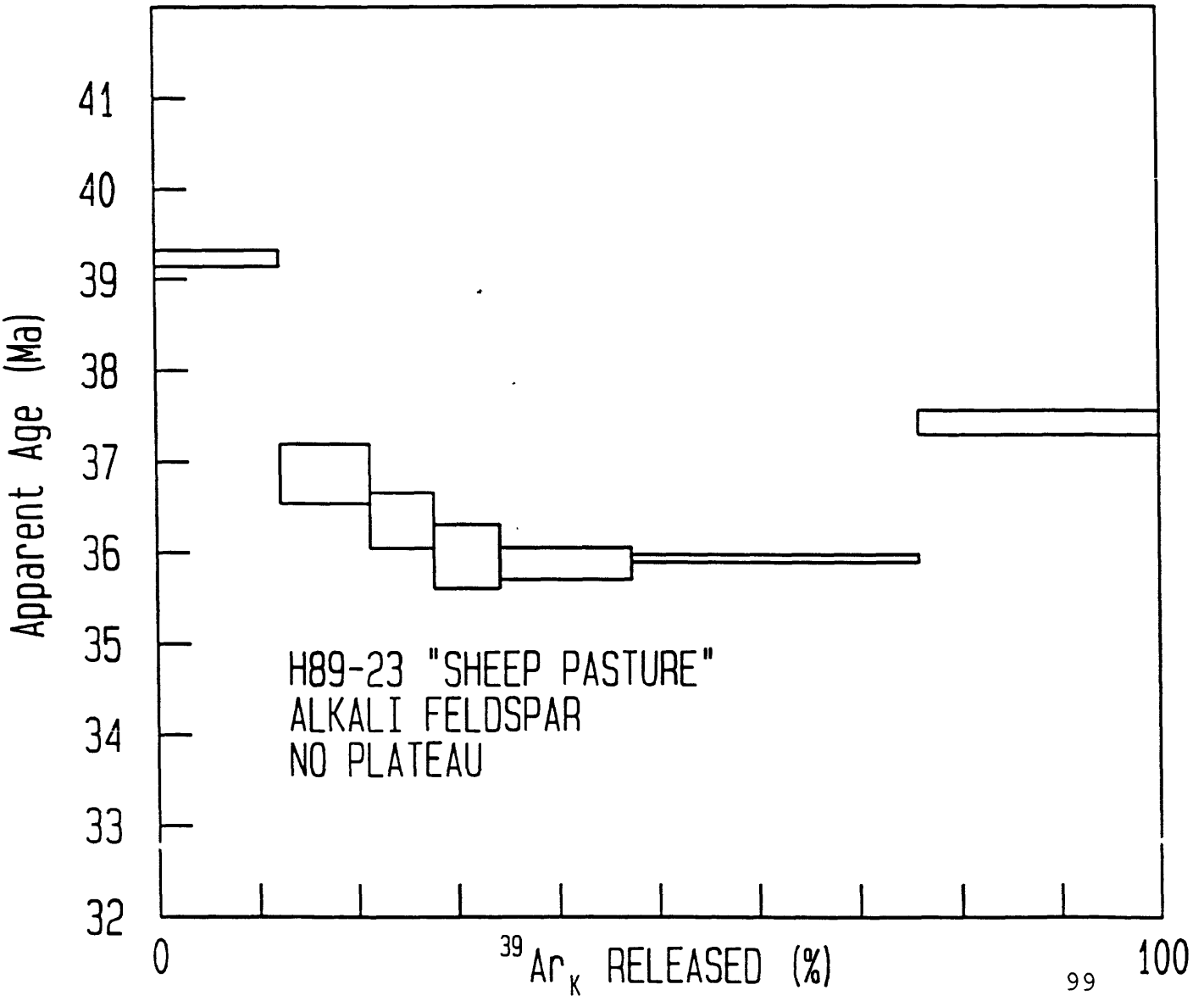
TEMP C	Initial & radiogenic 40Ar	Potassium derived 39Ar	Chlorine derived 38Ar	Calcium derived 37Ar	Initial 36Ar	AGE* in Ma	**
1050	2.020E-11	4.394E-12	***	1.369E-13	***	39.23 +	.05
1100	1.396E-11	3.236E-12	***	1.030E-13	***	36.87 +	.16
1140	9.676E-12	2.282E-12	***	7.375E-14	***	36.35 +	.15
1190	9.774E-12	2.322E-12	***	7.444E-14	***	35.96 +	.17
1250	1.965E-11	4.689E-12	***	1.545E-13	***	35.88 +	.09
1340	4.281E-11	1.020E-11	***	3.394E-13	***	35.93 +	.02
1650	3.787E-11	8.621E-12	***	2.873E-13	1.152E-15	37.43 +	.07
TOTAL GAS	1.539E-10	3.575E-11	***	1.169E-12	3.195E-15	36.81	

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 02/05/91

v 02/05/91 15:07:21 7 Feb 1992 H89-23 RD 73



v 02/05/91 (40/36in = 295.5)

21-9 SLEEPING LION, 49,50:RD56

R A W D A T A

FILE	TEMP	40Ar	39Ar	38Ar	37Ar	36Ar mean	TRAP CURRENT	MANIFOLD OPTION
17746:	750	609868	111510	3870	2110	426	200	ALL
	±	457	138	39	14	14		
17747:	900	1087868	260037	3420	1116	104	200	ALL
	±	565	184	34	9	6		
17748:	1075	2834689	685944	8888	3688	156	200	ALL
	±	2077	599	44	5	12		
17749:	1120	2628339	638182	8260	3168	107	200	ALL
	±	1503	274	41	5	12		
17750:	1150	2051911	496050	6436	2139	85	200	ALL
	±	1697	203	32	17	7		
17751:	1180	1584558	380827	4919	1557	81	200	ALL
	±	853	168	49	13	11		
17752:	1300	1419141	336909	4349	1374	104	200	ALL
	±	451	143	43	16	10		

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	36	3063	634	1496	0	3	0	1	0	80
900	83	1621	1479	3489	0	2	0	1	-0	19
1075	219	5364	3901	9202	0	6	0	2	-0	29
1120	204	4611	3629	8562	0	5	0	2	-0	20
1150	158	3117	2821	6655	0	4	0	1	-0	16
1180	122	2270	2166	5109	0	3	0	1	-0	15
1300	108	2006	1916	4520	0	2	0	1	-0	19

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	3.8	79.4	11.19	110	4.331	38.31	±	.33	.34	.39
B	900	8.9	97.2	49.34	0	4.055	35.89	±	.07	.11	.21
C	1075	23.6	98.4	39.35	0	4.056	35.89	±	.06	.11	.21
D	1120	21.9	98.8	42.60	0	4.059	35.93	±	.06	.11	.21
E	1150	17.0	98.8	49.00	0	4.076	36.07	±	.05	.10	.21
F	1180	13.1	98.5	51.67	0	4.088	36.18	±	.08	.12	.22
G	1300	11.6	97.8	51.77	0	4.111	36.38	±	.08	.12	.22

Total gas K/Ca = 44.6

Precisions are 1 sigma, measured in Ma. Measured 40/36 atm = 296.5 ±.5
J = 0.004955 ± 0.25% (intra-package) ± 0.50% (inter-package)
Trap current factors- 40: 1 100: .43 200: 1
Manifold factors- ALL: 1 SPLIT 1: 3.6 SPLIT 2: 12.96 SPLIT 3: 46.656
Sensitivity = 1.650E-17 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 2/18/89

21-9 SLEEPING LION, 49,50:RD56

J = 0.004955 ± 0.25% SAMPLE WT = 0.5578 g

TEMP C	Initial & radiogenic 40Ar	Potassium derived 39Ar	Chlorine derived 38Ar	Calcium derived 37Ar	Initial 36Ar	AGE* in Ma	**
750	1.005E-11	1.842E-12	4.058E-14	8.558E-14	7.020E-15	38.31 ±	.34
900	1.793E-11	4.296E-12	***	4.527E-14	1.713E-15	35.89 ±	.11
1075	4.671E-11	1.133E-11	***	1.497E-13	2.550E-15	35.89 ±	.11
1120	4.331E-11	1.054E-11	***	1.287E-13	1.735E-15	35.93 ±	.11
1150	3.381E-11	8.194E-12	***	8.695E-14	1.388E-15	36.07 ±	.10
1180	2.611E-11	6.291E-12	***	6.331E-14	1.325E-15	36.18 ±	.12
1300	2.338E-11	5.565E-12	***	5.591E-14	1.714E-15	36.38 ±	.12
TOTAL GAS	2.013E-10	4.806E-11	4.058E-14	6.154E-13	1.744E-14	36.12	

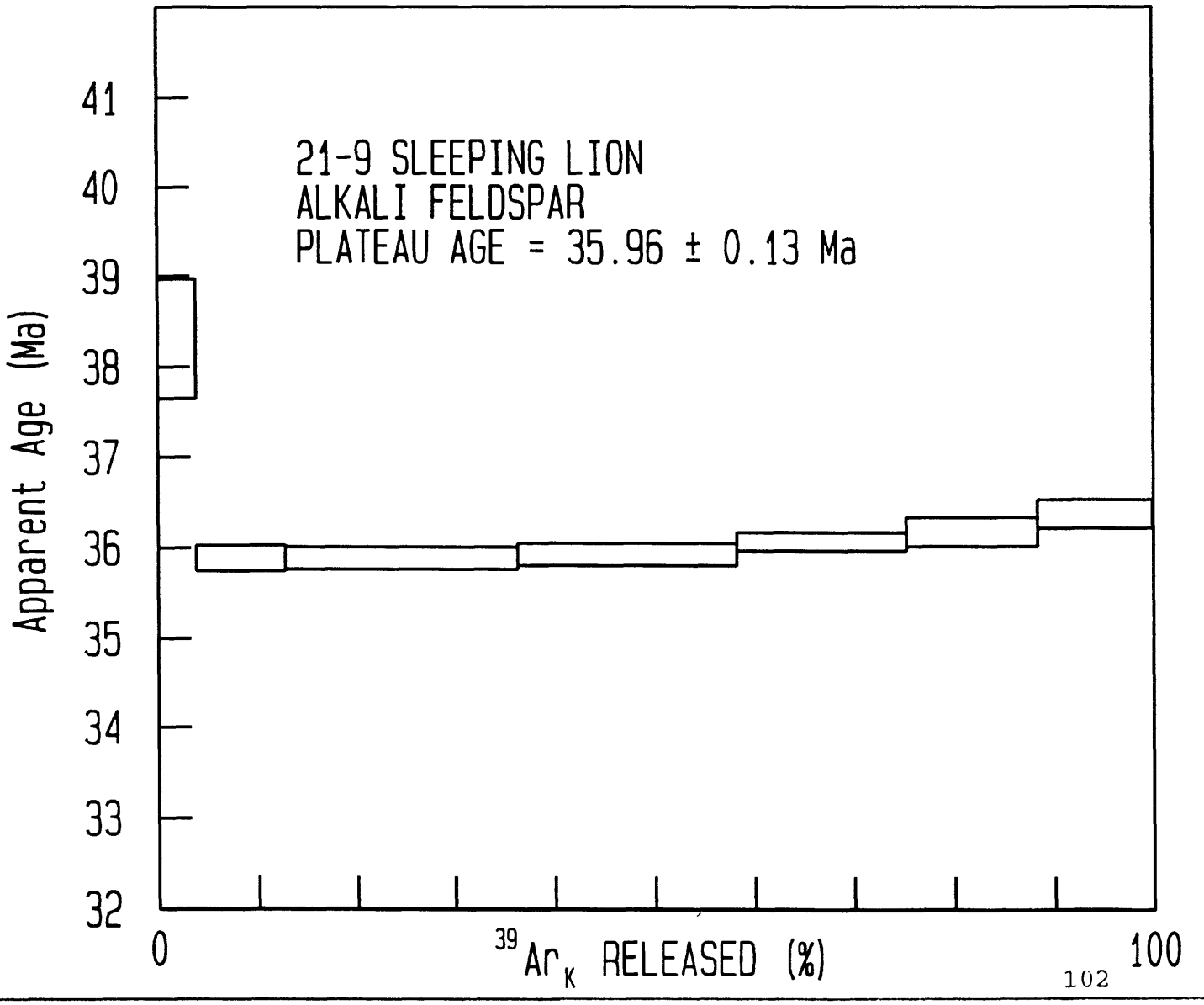
K/Ca = 44.6

71.5% of gas on plateau, steps 900 through 1150 PLATEAU AGE = 35.96 ± .09

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 2/18/89

F not reset


21-9 SLEEPING LION
ALKALI FELDSPAR
PLATEAU AGE = 35.96 ± 0.13 Ma
Apparent Age (Ma)
41
40
39
38
37
36
35
34
33
32
0
$^{39}Ar_K$ RELEASED (%)
100
102

J87-62 SLEEPING LION; 55,56:RD56

R A W D A T A

FILE	TEMP	40Ar	39Ar	38Ar	37Ar	36Ar mean	TRAP CURRENT	MANIFOLD OPTION
17758:	750	591641	134911	2049	2061	69	200	SPLIT 1
	±	20	50	61	12	11		
17759:	900	255237	62201	836	492	22	200	ALL
	±	128	27	42	10	21		
17760:	1075	2964043	727523	9432	5226	52	200	ALL
	±	1885	418	47	15	17		
17761:	1120	1995504	488500	6303	3282	38	200	ALL
	±	815	330	32	9	14		
17762:	1150	2221964	541505	6968	3525	46	200	ALL
	±	811	177	35	23	11		
17763:	1180	1231526	299251	3870	1917	29	200	ALL
	±	157	131	39	33	8		
17764:	1300	1696694	405892	0	3017	41	200	ALL
	±	623	432	0	6	10		

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	K-derived 38Ar	K-derived 37Ar	Ca-derived 39Ar	Ca-derived 38Ar	Ca-derived 36Ar	Cl-der 36Ar	Initial 38Ar
750	44	3058	767	1810	0	3	0	1	0	13
900	20	731	354	834	0	1	0	0	0	4
1075	236	7769	4137	9760	0	9	0	3	-0	9
1120	158	4884	2778	6553	0	6	0	2	-0	7
1150	176	5251	3079	7265	0	6	0	2	-0	8
1180	97	2857	1702	4015	0	3	0	1	-0	5
1300	132	4500	2308	5445	0	5	0	2	-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	750	16.1	96.6	13.69	1280	4.227	37.39	±	.22	.24	.30
B	900	2.1	97.5	26.42	21357	3.992	35.33	±	.86	.87	.88
C	1075	24.2	99.5	29.07	0	4.044	35.78	±	.07	.11	.21
D	1120	16.2	99.5	31.06	0	4.053	35.86	±	.08	.12	.22
E	1150	18.0	99.4	32.04	0	4.069	36.00	±	.05	.11	.21
F	1180	9.9	99.3	32.55	0	4.078	36.08	±	.07	.11	.22
G	1300	13.5	99.3	28.04	0	4.141	36.64	±	.08	.12	.22

Total gas K/Ca = 27.6

Precisions are 1 sigma, measured in Ma. Measured 40/36 atm = 296.5 ±.5
J = 0.004954 ± 0.25% (intra-package) ± 0.50% (inter-package)
Trap current factors- 40: 1 100: .43 200: 1
Manifold factors- ALL: 1 SPLIT 1: 3.6 SPLIT 2: 12.96 SPLIT 3: 46.656
Sensitivity = 1.650E-17 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±2.3E-03 3839=1.3E-02±2.4E-04 4039=5.7E-03±4.0E-03

J87-62 SLEEPING LION; 55,56:RD56

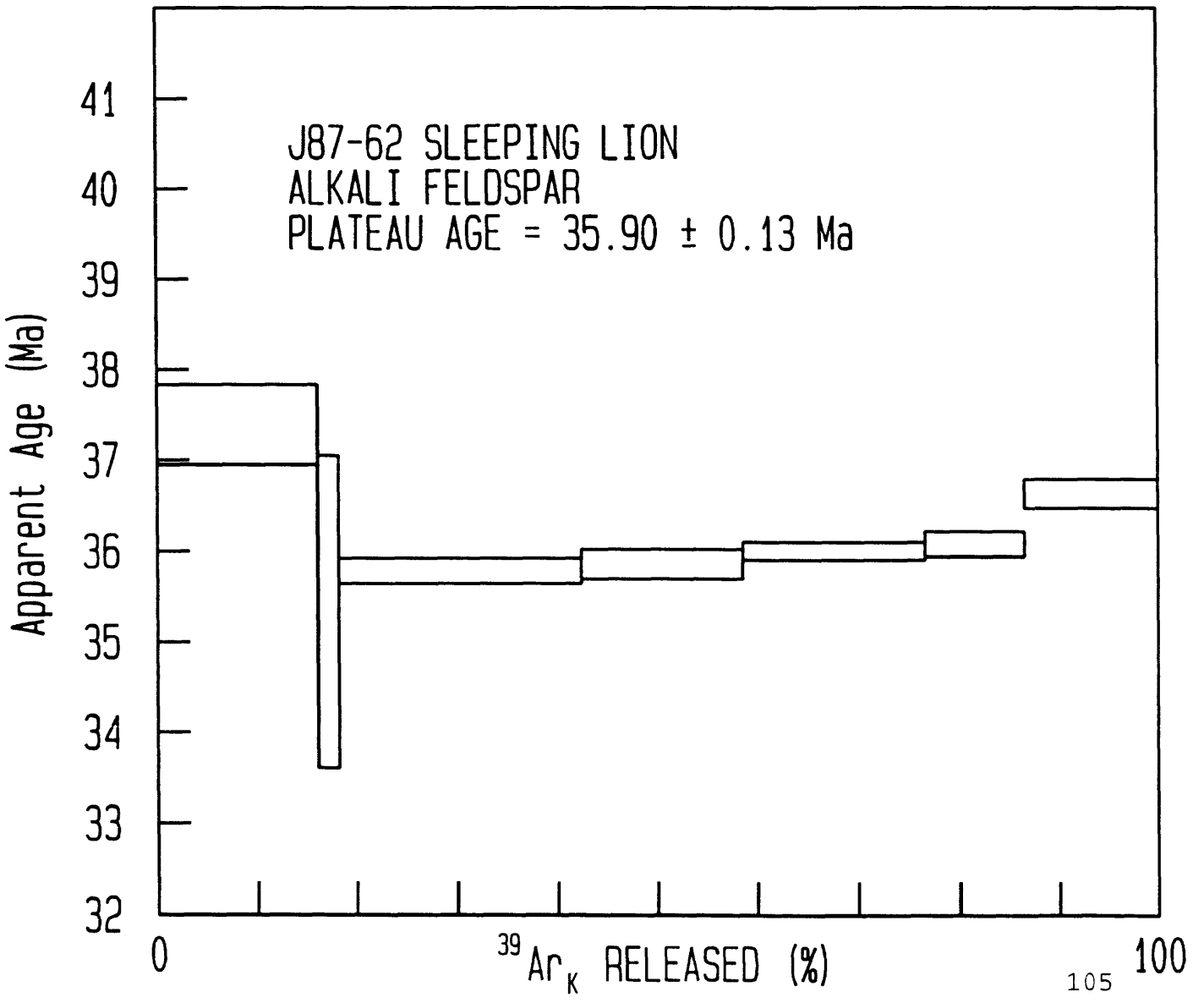
J = 0.004954 ± 0.25% SAMPLE WT = 0.5620 g

TEMP C	Initial & radiogenic 40Ar	Potassium derived 39Ar	Chlorine derived 38Ar	Calcium derived 37Ar	Initial 36Ar	AGE* in Ma	**
750	3.510E-11	8.023E-12	1.517E-14	3.048E-13	4.013E-15	37.39 ±	.24
900	4.206E-12	1.028E-12	***	2.023E-14	***	35.33 ±	.87
1075	4.884E-11	1.202E-11	***	2.150E-13	8.095E-16	35.78 ±	.11
1120	3.288E-11	8.070E-12	***	1.351E-13	***	35.86 ±	.12
1150	3.661E-11	8.945E-12	***	1.452E-13	7.170E-16	36.00 ±	.11
1180	2.029E-11	4.943E-12	***	7.897E-14	***	36.08 ±	.11
1300	2.796E-11	6.705E-12	***	1.244E-13	***	36.64 ±	.12
TOTAL GAS	2.059E-10	4.973E-11	1.528E-14	1.024E-12	7.575E-15	36.23	
	K/Ca = 27.6						

60.4% of gas on plateau, steps 900 through 1150 PLATEAU AGE = 35.90 ± .13

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 2/18/89


J87-62 SLEEPING LION
ALKALI FELDSPAR
PLATEAU AGE = 35.90 ± 0.13 Ma
Apparent Age (Ma)
41
40
39
38
37
36
35
34
33
32
0
$^{39}Ar_K$ RELEASED (%)
100

R A W D A T A

FILE	TEMP	40Ar	39Ar	38Ar	37Ar	36Ar *	TRAP CURRENT	MANIFOLD OPTION
29356	1050	693500	168295	2213	0	47	200	ALL
	±	1274	313	4	0	5		
29357	1120	283252	69695	933	0	12	200	ALL
	±	214	54	8	0	7		
29358	1150	80293	19669	258	0	6	200	ALL
	±	52	22	12	0	5		
29359	1180	111734	27480	377	0	5	200	ALL
	±	66	35	8	0	6		
29360	1220	379026	93730	1232	0	9	200	ALL
	±	65	34	22	0	3		
29361	1270	1196424	295943	3846	0	21	200	ALL
	±	814	115	15	0	2		
29362	1330	2383824	586605	7603	0	44	200	ALL
	±	3699	170	6	0	7		
29363	1450	757172	185596	2396	0	14	200	ALL
	±	355	184	7	0	3		

* 36Ar peak values less than 30 are means those above 30 are from linear regressions

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	1188	0	964	2274	0	0	0	0	-0	9
1120	492	0	399	942	0	0	0	0	-0	2
1150	139	0	113	266	0	0	0	0	-0	1
1180	194	0	157	371	0	0	0	0	0	1
1220	662	0	537	1267	0	0	0	0	-0	2
1270	2089	0	1695	3999	0	0	0	0	-0	4
1330	4141	0	3360	7927	0	0	0	0	-1	8
1450	1310	0	1063	2508	0	0	0	0	-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	11.6	98.0	0.00	0	3.998	35.97 ±	.10	.14	.23
B	1120	4.8	98.7	0.00	0	3.972	35.74 ±	.25	.26	.32
C	1150	1.4	97.8	0.00	0	3.952	35.56 ±	.69	.70	.72
D	1180	1.9	98.7	0.00	8756	3.972	35.73 ±	.60	.61	.64
E	1220	6.5	99.3	0.00	0	3.976	35.77 ±	.08	.12	.22
F	1270	20.5	99.5	0.00	0	3.982	35.83 ±	.03	.09	.20
G	1330	40.5	99.4	0.00	0	4.001	36.00 ±	.06	.11	.21
H	1450	12.8	99.5	0.00	0	4.018	36.14 ±	.04	.10	.21

Total gas K/Ca = 0.0

Precisions are 1 sigma, measured in Ma. Measured 40/36 atm = 297.2 ±.5
J = 0.005037 ± 0.25% (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

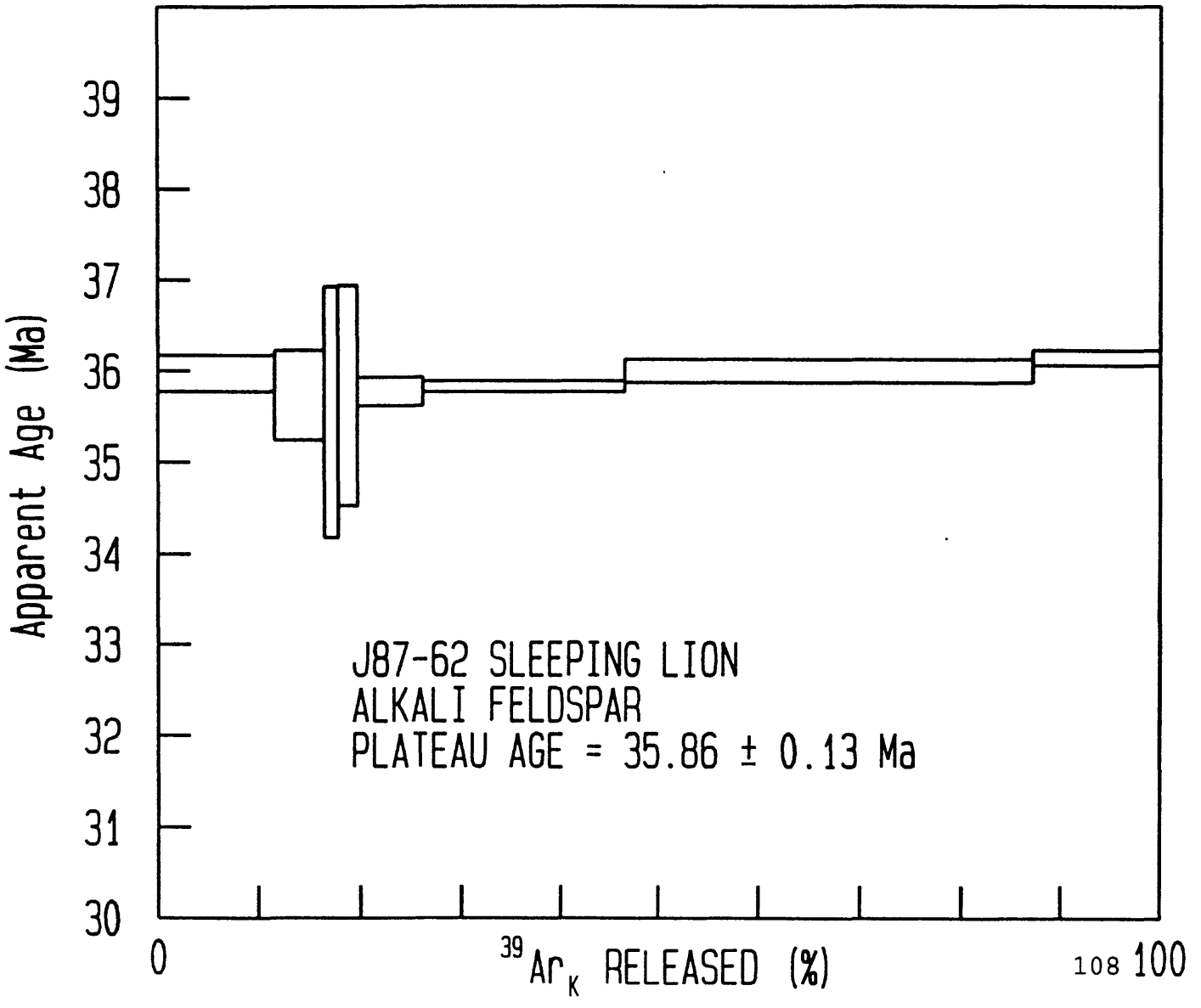
J = 0.005037 ± 0.25% SAMPLE WT = 0.3300 g

TEMP C	Initial & radiogenic 40Ar	Potassium derived 39Ar	Chlorine derived 38Ar	Calcium derived 37Ar	Initial 36Ar	AGE* in Ma	**
1050	6.925E-12	1.697E-12	***	***	4.709E-16	35.97 ±	.10
1120	2.829E-12	7.029E-13	***	***	***	35.74 ±	.25
1150	8.018E-13	1.984E-13	***	***	***	35.56 ±	.69
1180	1.116E-12	2.771E-13	***	***	***	35.73 ±	.60
1220	3.785E-12	9.453E-13	***	***	***	35.77 ±	.08
1270	1.195E-11	2.985E-12	***	***	***	35.83 ±	.03
1330	2.380E-11	5.916E-12	***	***	4.524E-16	36.00 ±	.06
1450	7.561E-12	1.872E-12	***	***	***	36.14 ±	.04
TOTAL GAS	5.877E-11	1.459E-11	***	***	1.599E-15	35.94	

87.2% of gas on plateau, steps 1050 through 1330 PLATEAU AGE = 35.86 + .13
53.4% of gas on plateau, steps 1330 through 1450 PLATEAU AGE = 36.10 + .13

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 23:00:54 17 Apr 1993 J87-62 KSPAR #17 RD62



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

R A W D A T A

FILE	TEMP	40Ar	39Ar	38Ar	37Ar	36Ar	TRAP CURRENT	MANIFOLD OPTION
					ä	*		
35305	960	225916	80164	1541	521	71	200	EALL
	▪	6005	525	29	38	5		
35306	1050	353708	130360	1676	263	23	200	EALL
	▪	152	114	3	13	5		
35307	1100	205369	75741	963	311	13	200	EALL
	▪	44	37	4	11	5		
35308	1150	464201	173419	2204	813	13	200	EALL
	▪	195	115	12	6	6		
35309	1200	963180	359166	4595	1258	11	200	EALL
	▪	435	256	6	18	5		
35310	1230	328516	121396	1539	379	13	200	EALL
	▪	113	106	8	9	4		
35311	1300	90041	32719	420	119	4	200	EALL
	▪	30	17	7	11	4		

* 36Ar peak values less than 10 are means those above 10 are from linear regressions

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
960	17	416	456	1076	0	1	0	0	0	13
1050	27	210	742	1750	0	0	0	0	-0	4
1100	16	249	431	1017	0	0	0	0	-0	2
1150	36	650	987	2328	0	1	0	0	-0	2
1200	74	1008	2044	4821	0	2	0	1	-0	2
1230	25	304	691	1630	0	0	0	0	-0	2
1300	7	95	186	439	0	0	0	0	-0	1

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 960	8.2	90.7	44.39	403	2.547	34.51 ▪	1.04	1.04	1.06
B 1050	13.4	98.1	142.88	0	2.650	35.90 ▪	.14	.17	.25
C 1100	7.8	98.2	70.09	0	2.652	35.91 ▪	.24	.26	.32
D 1150	17.8	99.2	61.47	0	2.644	35.81 ▪	.14	.17	.25
E 1200	36.9	99.7	82.16	0	2.663	36.07 ▪	.06	.11	.21
F 1230	12.5	98.8	92.11	0	2.663	36.07 ▪	.14	.16	.25
G 1300	3.4	98.6	79.33	0	2.704	36.62 ▪	.48	.48	.52
Total gas K/Ca =			83.7						

Precisions are 1 sigma, measured in Ma. Measured 40/36 atm = 297.3 ▪.5
J = 0.007583 ▪ 0.25% (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: 2.07 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

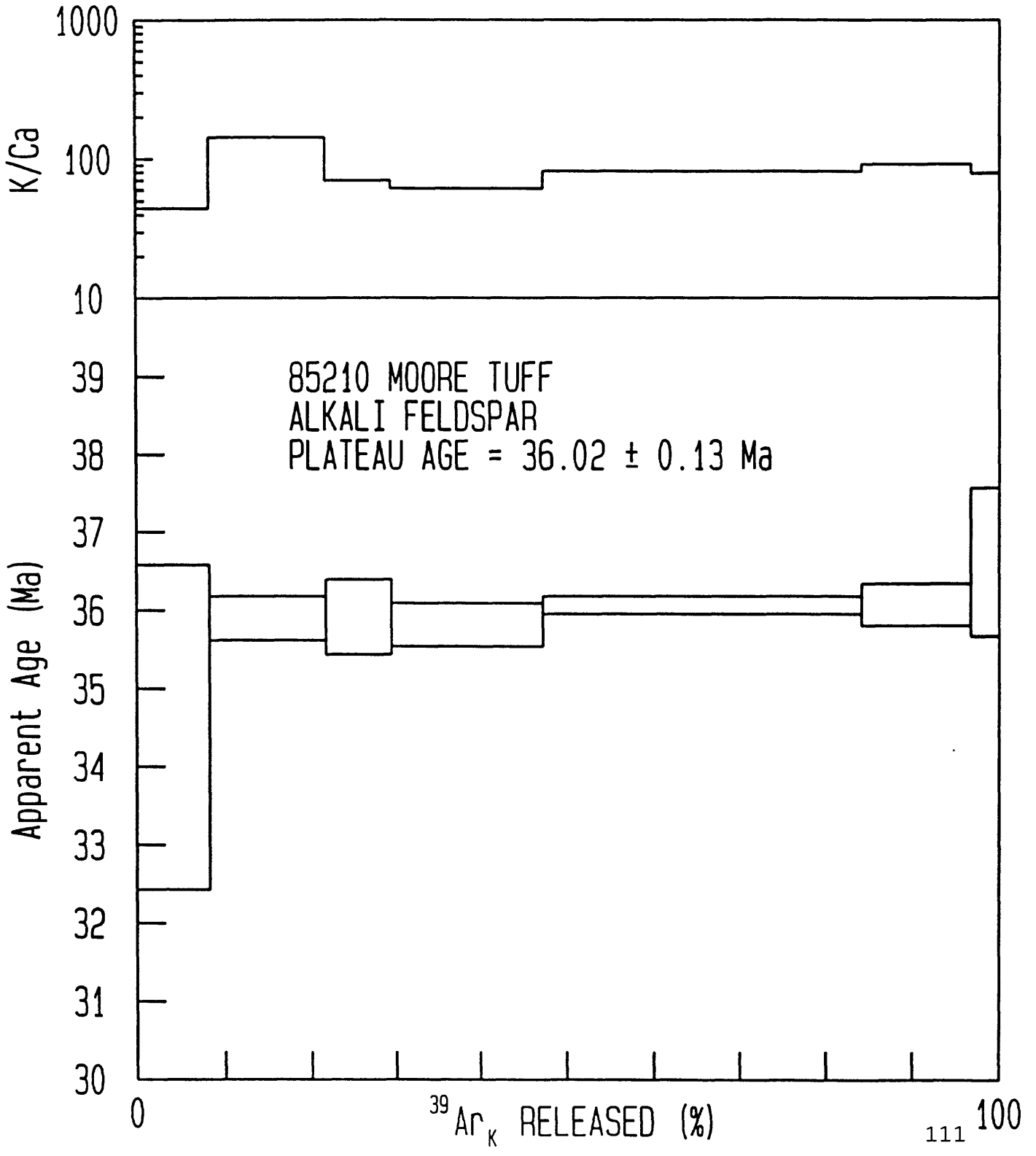
J = 0.007583 ▪ 0.25% SAMPLE WT = 0.2514 g

TEMP C	Initial & radiogenic 40Ar	Potassium derived 39Ar	Chlorine derived 38Ar	Calcium derived 37Ar	Initial 36Ar	AGE* in Ma	**
960	6.884E-12	2.452E-12	1.474E-14	2.872E-14	2.164E-15	34.51 ▪	1.04
1050	1.078E-11	3.987E-12	***	1.451E-14	***	35.90 ▪	.14
1100	6.257E-12	2.317E-12	***	1.719E-14	***	35.91 ▪	.24
1150	1.414E-11	5.304E-12	***	4.487E-14	***	35.81 ▪	.14
1200	2.935E-11	1.099E-11	***	6.953E-14	***	36.07 ▪	.06
1230	1.001E-11	3.713E-12	***	2.096E-14	***	36.07 ▪	.14
1300	2.743E-12	1.001E-12	***	6.560E-15	***	36.62 ▪	.48
TOTAL GAS	8.016E-11	2.976E-11	1.474E-14	2.023E-13	4.508E-15	35.88	

100.0% of gas on plateau, steps 960 through 1300 PLATEAU AGE = 36.02 + .13

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 19:49:38 19 Feb 1993 85210 #129 RD93 ALKALI FELDSPAR



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

R A W D A T A

FILE	TEMP	40Ar	39Ar	38Ar	37Ar	36Ar mean	TRAP CURRENT	MANIFOLD OPTION
19676:	750	74094	12540	180	80	74	200	ALL
	±	20	12	36	11	14		
19677:	900	649537	156650	2031	1108	45	200	ALL
	±	54	44	61	12	10		
19678:	1075	2166564	530350	6849	3598	50	200	ALL
	±	467	101	34	13	13		
19679:	1120	1479225	362388	4670	2396	26	200	ALL
	±	124	37	47	23	15		
19680:	1150	1550155	379808	4894	2508	34	200	ALL
	±	753	100	49	17	27		
19681:	1180	1298055	318008	4089	2099	21	200	ALL
	±	790	239	41	26	5		
19682:	1220	1603552	393163	5044	2641	24	200	ALL
	±	558	262	50	9	11		
19683:	1300	3777414	924195	11927	6243	55	200	ALL
	±	1334	217	36	26	19		
19684:	1450	4690008	1146456	14761	7635	49	200	ALL
	±	1669	403	44	18	10		

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	222	71	168	0	0	0	0	0	14
900	76	3086	891	2102	0	3	0	1	-0	8
1075	258	10026	3016	7116	0	9	0	4	-0	9
1120	176	6680	2061	4862	0	6	0	2	-0	4
1150	185	6999	2160	5096	0	6	0	3	-0	6
1180	155	5861	1809	4267	0	5	0	2	-0	4
1220	191	7377	2236	5275	0	7	0	3	-0	4
1300	450	17456	5256	12401	0	16	1	6	-0	9
1450	558	21358	6520	15383	0	20	1	8	-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	intra-package	inter-package
A	750	.3	70.4	21.63	1161	4.152	37.03	±	3.00	3.00	3.01
B	900	3.7	98.0	19.40	0	4.053	36.16	±	.17	.19	.26
C	1075	12.6	99.4	20.22	0	4.048	36.11	±	.07	.11	.21
D	1120	8.6	99.5	20.74	0	4.052	36.15	±	.11	.14	.23
E	1150	9.0	99.4	20.75	0	4.046	36.09	±	.19	.21	.28
F	1180	7.5	99.6	20.75	0	4.053	36.16	±	.05	.10	.21
G	1220	9.3	99.6	20.38	0	4.052	36.14	±	.08	.12	.22
H	1300	21.9	99.6	20.25	0	4.061	36.22	±	.06	.11	.21
I	1450	27.1	99.7	20.54	0	4.069	36.30	±	.03	.10	.21
Total gas K/Ca =				20.4							

Precisions are 1 sigma, measured in Ma. Measured 40/36 atm = 296.5 ±.5
J = 0.004995 ± 0.25% (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 = 6.000E-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±4.0E-03

J = 0.004995 ± 0.25% SAMPLE WT = 0.3301 g

TEMP C	Initial & radiogenic 40Ar	Potassium derived 39Ar	Chlorine derived 38Ar	Calcium derived 37Ar	Initial 36Ar	AGE* in Ma	**
750	4.441E-13	7.534E-14	***	1.812E-15	4.444E-16	37.03 ±	3.00
900	3.892E-12	9.411E-13	***	2.523E-14	2.613E-16	36.16 ±	.19
1075	1.298E-11	3.186E-12	***	8.195E-14	2.814E-16	36.11 ±	.11
1120	8.863E-12	2.177E-12	***	5.460E-14	***	36.15 ±	.14
1150	9.288E-12	2.282E-12	***	5.719E-14	***	36.09 ±	.21
1180	7.777E-12	1.911E-12	***	4.788E-14	***	36.16 ±	.10
1220	9.608E-12	2.362E-12	***	6.026E-14	***	36.14 ±	.12
1300	2.263E-11	5.552E-12	***	1.426E-13	2.908E-16	36.22 ±	.11
1450	2.810E-11	6.888E-12	***	1.744E-13	2.476E-16	36.30 ±	.10
TOTAL GAS	1.036E-10	2.537E-11	***	6.459E-13	2.099E-15	36.20	

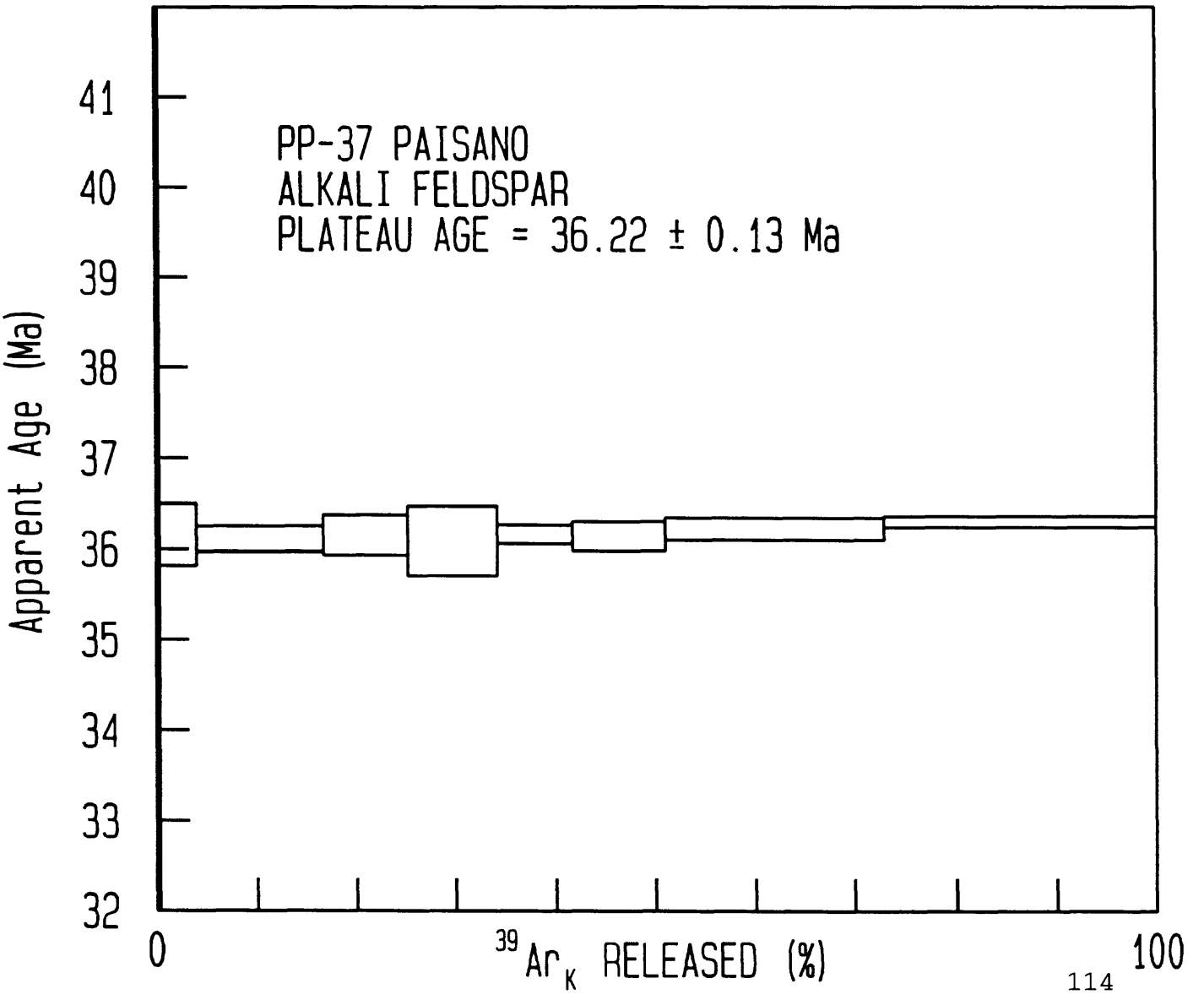
K/Ca = 20.4

100.0% of gas on plateau, steps 750 through 1450 PLATEAU AGE = 36.22 ± .13

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 2/18/89

v 08/23/93 14:20:56 7 Dec 1993



v 08/23/93 (40/36in = 295.5)

PP173

R A W D A T A

FILE	TEMP	40Ar	39Ar	38Ar	37Ar	36Ar mean	TRAP CURRENT	MANIFOLD OPTION
19696:	900	937842	223487	3468	1296	204	200	ALL
	±	4181	488	35	25	25		
19697:	1075	3013253	738257	9582	3965	99	200	ALL
	±	387	352	48	20	19		
19698:	1150	2867691	703775	9054	3790	64	200	ALL
	±	1214	190	45	28	8		
19699:	1220	3292882	808499	10392	4294	55	200	ALL
	±	1265	325	31	10	8		
19700:	1300	4745140	1158765	14925	6266	121	200	ALL
	±	1883	396	45	6	18		
19701:	1360	2987609	725496	9351	3902	86	200	ALL
	±	1494	474	47	28	18		
19702:	1450	438198	105100	1355	562	32	200	ALL
	±	137	17	41	18	14		

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
900	110	3698	1271	2999	0	3	0	1	0	38
1075	364	11316	4199	9906	0	10	0	4	-0	18
1150	347	10826	4003	9443	0	10	0	4	-0	11
1220	398	12272	4598	10848	0	11	1	4	-0	10
1300	571	17920	6591	15548	0	16	1	6	-0	21
1360	358	11167	4126	9735	0	10	0	4	-0	15
1450	52	1610	598	1410	0	1	0	1	-0	6

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	5.0	93.6	23.24	1056	3.916	35.19	±	.35	.36	.40
B	1075	16.5	99.1	25.09	0	4.032	36.22	±	.07	.11	.22
C	1150	15.8	99.4	25.01	0	4.038	36.27	±	.04	.10	.21
D	1220	18.1	99.5	25.35	0	4.043	36.31	±	.03	.10	.21
E	1300	26.0	99.3	24.88	0	4.055	36.41	±	.04	.10	.21
F	1360	16.3	99.2	25.00	0	4.073	36.58	±	.07	.12	.22
G	1450	2.4	97.9	25.14	0	4.069	36.54	±	.35	.36	.40
Total gas K/Ca =				25.0							

Precisions are 1 sigma, measured in Ma. Measured 40/36 atm = 296.5 ±.5
J = 0.005029 ± 0.25% (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 = 6.000E-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±4.0E-03

PP173

J = 0.005029 ± 0.25% SAMPLE WT = 0.3299 g

TEMP C	Initial & radiogenic 40Ar	Potassium derived 39Ar	Chlorine derived 38Ar	Calcium derived 37Ar	Initial 36Ar	AGE* in Ma	**
900	5.619E-12	1.343E-12	3.078E-15	3.004E-14	1.221E-15	35.19 ±	.36
1075	1.805E-11	4.435E-12	***	9.192E-14	5.726E-16	36.22 ±	.11
1150	1.718E-11	4.228E-12	***	8.792E-14	3.630E-16	36.27 ±	.10
1220	1.973E-11	4.857E-12	***	9.964E-14	3.051E-16	36.31 ±	.10
1300	2.843E-11	6.962E-12	***	1.455E-13	6.899E-16	36.41 ±	.10
1360	1.790E-11	4.359E-12	***	9.064E-14	4.965E-16	36.58 ±	.12
1450	2.626E-12	6.314E-13	***	1.306E-14	***	36.54 ±	.36
TOTAL GAS	1.095E-10	2.682E-11	3.078E-15	5.587E-13	3.839E-15	36.31	

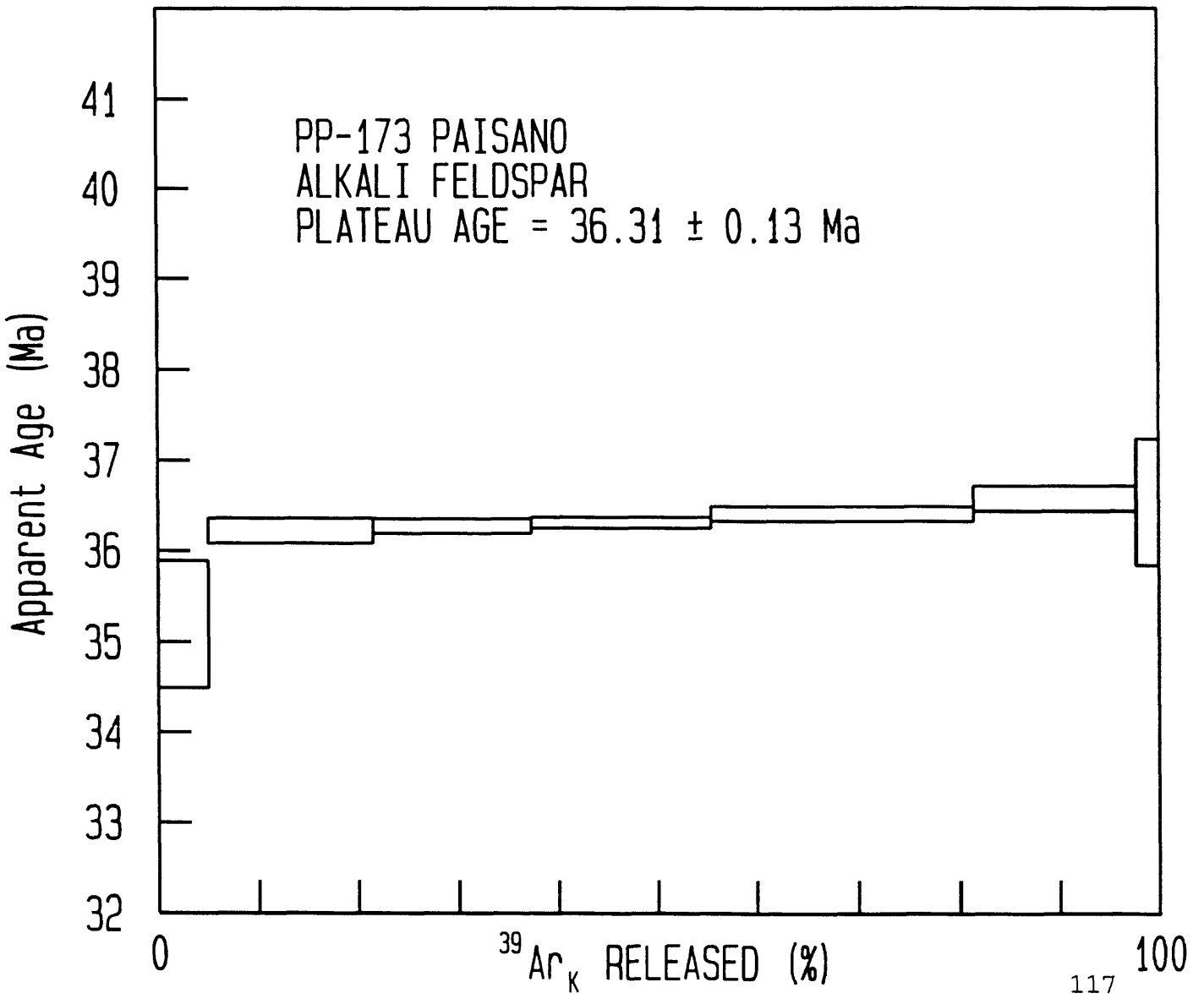
K/Ca = 25.0

76.4% of gas on plateau, steps 1075 through 1300 PLATEAU AGE = 36.31 ± .13

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 2/18/89

v 08/23/93 14:29:47 7 Dec 1993



v 08/23/93 (40/36in = 295.5)

R A W D A T A

FILE	TEMP	40Ar	39Ar	38Ar	37Ar	36Ar regression	TRAP CURRENT	MANIFOLD OPTION
	1075	780353	182699	2385	0	39	200	ALL
	±	1657	407	11	0	6		
	1120	401552	94521	1226	0	18	200	ALL
	±	604	124	10	0	9		
	1150	429703	101284	1242	0	17	200	ALL
	±	148	216	12	0	8		
	1180	394818	93123	1216	0	13	200	ALL
	±	402	120	7	0	6		
	1220	489691	115818	1479	0	15	200	ALL
	±	408	135	8	0	13		
	1300	1114805	263297	3428	0	25	200	ALL
	±	516	102	6	0	4		
	1450	2285474	533538	6907	0	77	200	ALL
	±	4891	928	7	0	1		

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
1075	645	0	1043	2460	0	0	0	0	-0	7
1120	371	0	540	1273	0	0	0	0	-0	3
1150	358	0	578	1364	0	0	0	0	-0	3
1180	371	0	532	1255	0	0	0	0	-0	3
1220	409	0	661	1560	0	0	0	0	-0	3
1300	930	0	1503	3546	0	0	0	0	-0	5
1450	1884	0	3046	7185	0	0	0	0	-0	15

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 1075	13.2	98.5	0.00	0	4.181	36.50 ±	.11	.15	.24
B 1120	6.8	98.7	0.00	0	4.163	36.34 ±	.25	.27	.32
C 1150	7.3	98.8	0.00	0	4.165	36.36 ±	.19	.21	.28
D 1180	6.7	99.0	0.00	0	4.169	36.39 ±	.16	.19	.26
E 1220	8.4	99.1	0.00	0	4.162	36.33 ±	.29	.30	.35
F 1300	19.0	99.3	0.00	0	4.179	36.48 ±	.04	.10	.21
G 1450	38.5	99.0	0.00	0	4.214	36.78 ±	.08	.12	.22
Total gas K/Ca =			0.0						

Precisions are 1 sigma, measured in Ma. Measured 40/36 atm = 297.2 ±.5
J = 0.004888 ± 0.25% (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 23:20:29 17 Apr 1993

PP-220 KSPAR #1 RD60

J = 0.004888 ± 0.25% SAMPLE WT = 0.3299 g

TEMP C	Initial & radiogenic 40Ar	Potassium derived 39Ar	Chlorine derived 38Ar	Calcium derived 37Ar	Initial 36Ar	AGE* in Ma	**
1075	7.793E-12	1.836E-12	***	***	***	36.50 ±	.11
1120	4.010E-12	9.503E-13	***	***	***	36.34 ±	.25
1150	4.291E-12	1.018E-12	***	***	***	36.36 ±	.19
1180	3.943E-12	9.363E-13	***	***	***	36.39 ±	.16
1220	4.890E-12	1.164E-12	***	***	***	36.33 ±	.29
1300	1.113E-11	2.646E-12	***	***	***	36.48 ±	.04
1450	2.282E-11	5.362E-12	***	***	7.767E-16	36.78 ±	.08
TOTAL GAS	5.888E-11	1.391E-11	***	***	2.069E-15	36.56	

61.5% of gas on plateau, steps 1075 through 1300 PLATEAU AGE = 36.47 + .13

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

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

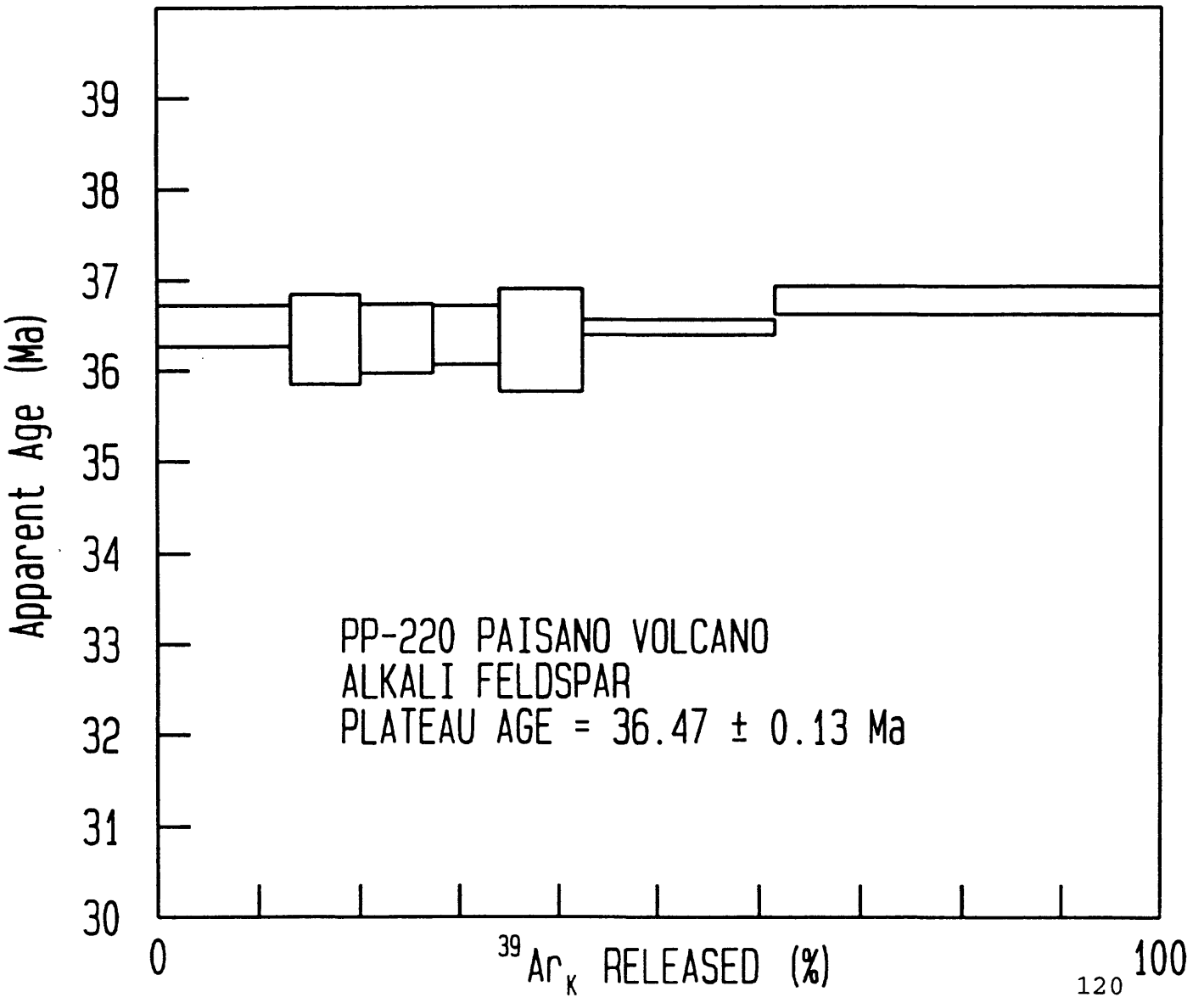
** 1-sigma precision estimates are for intra-sample reproducibility.

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

*** below detection limit

v 06/13/92

v 06/13/92 23:25:51 17 Apr 1993 PP-220 KSPAR #1 RD60



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

v 02/05/91 H89-19 15:13:16 7 Feb 1992

R A W D A T A

FILE	TEMP	40Ar	39Ar	38Ar	37Ar	36Ar regression	TRAP CURRENT	MANIFOLD OPTION
24511	1050	914087	212873	2812	2472	39	200	EALL
	+	675	130	15	3	7		
24512	1100	740494	173169	2287	1983	14	200	EALL
	+	259	99	7	20	4		
24513	1140	587292	137561	1796	1546	5	200	EALL
	+	99	83	12	9	5		
24514	1190	805649	188922	2484	2132	24	200	EALL
	+	232	121	9	12	10		
24515	1250	1171275	274682	3600	3087	16	200	EALL
	+	461	79	13	7	10		
24516	1340	1755163	411420	5404	4576	15	200	EALL
	+	930	339	21	5	6		
24517	1650	1864791	434115	5708	4809	17	200	EALL
	+	617	229	8	6	13		

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	34	1456	1211	2857	0	3	0	1	-0	7
1100	28	1169	985	2324	0	2	0	1	-0	2
1140	22	912	783	1846	0	2	0	1	-0	1
1190	31	1259	1075	2536	0	2	0	1	-0	4
1250	45	1825	1563	3687	0	3	0	1	-0	3
1340	67	2709	2341	5522	0	5	0	2	-0	3
1650	71	2849	2470	5826	0	5	0	2	-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	11.6	98.8	28.11	0	4.228	36.39 +	.08	.12	.22
B 1100	9.4	99.5	28.48	0	4.241	36.51 +	.06	.11	.21
C 1140	7.5	99.8	29.02	0	4.247	36.56 +	.10	.14	.23
D 1190	10.3	99.1	28.89	0	4.215	36.29 +	.13	.16	.24
E 1250	15.0	99.6	29.00	0	4.235	36.46 +	.09	.13	.23
F 1340	22.4	99.8	29.29	0	4.244	36.53 +	.04	.10	.21
G 1650	23.7	99.8	29.40	0	4.273	36.77 +	.07	.12	.22
Total gas K/Ca =			29.0						

Precisions are 1 sigma, measured in Ma. Measured 40/36 atm = 297.2 +.5
J = 0.004820 + 0.25% (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

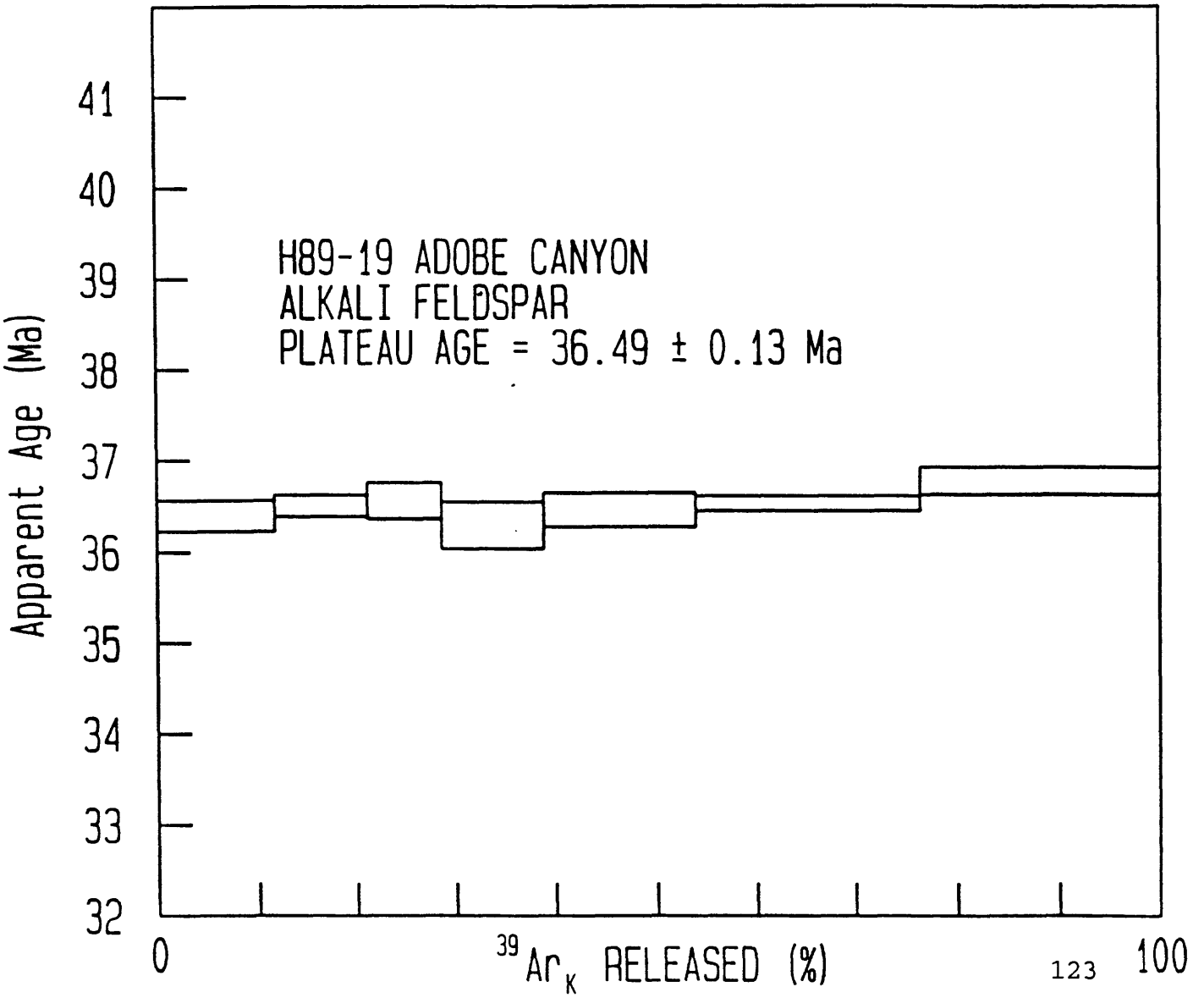
J = 0.004820 + 0.25% SAMPLE WT = 0.5006 g

TEMP C	Initial & radiogenic 40Ar	Potassium derived 39Ar	Chlorine derived 38Ar	Calcium derived 37Ar	Initial 36Ar	AGE* in Ma	**
1050	1.826E-11	4.264E-12	***	7.889E-14	***	36.39 +	.08
1100	1.479E-11	3.469E-12	***	6.333E-14	***	36.51 +	.06
1140	1.173E-11	2.756E-12	***	4.937E-14	***	36.56 +	.10
1190	1.609E-11	3.784E-12	***	6.811E-14	***	36.29 +	.13
1250	2.339E-11	5.502E-12	***	9.866E-14	***	36.46 +	.09
1340	3.506E-11	8.241E-12	***	1.463E-13	***	36.53 +	.04
1650	3.725E-11	8.696E-12	***	1.538E-13	***	36.77 +	.07
TOTAL GAS	1.566E-10	3.671E-11	***	6.585E-13	2.476E-15	36.54	

76.3% of gas on plateau, steps 1050 through 1340 PLATEAU AGE = 36.49 + .13

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 02/05/91 15:15:27 7 Feb 1992 H89-19 RD73



v 02/05/91 (40/36in = 295.5)

v 02/05/91 H89-37 14:41:27 7 Feb 1992

R A W D A T A

FILE	TEMP	40Ar	39Ar	38Ar	37Ar	36Ar *	TRAP CURRENT	MANIFOLD OPTION
24472	950	687742	143782	2174	821	223	200	EALL
	+	139	70	8	9	11		
24473	1050	1307789	294893	4067	1502	148	200	EALL
	+	853	159	14	14	4		
24474	1100	816175	189348	2471	1013	15	200	EALL
	+	148	141	5	11	8		
24475	1130	343713	79556	951	453	10	200	EALL
	+	90	59	29	6	5		
24476	1170	288902	66828	780	397	7	200	EALL
	+	190	46	10	4	7		
24477	1200	193635	44765	530	262	4	200	EALL
	+	96	41	15	14	4		
24478	1300	1948123	454372	6024	4300	17	200	EALL
	+	707	376	12	11	3		
24479	1650	3236558	738574	9773	5475	203	200	EALL
	+	1993	339	19	10	6		

* 36Ar peak values less than 10 are means those above 10 are from linear regressions

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
950	22	461	818	1930	0	1	0	0	0	42
1050	46	845	1678	3958	0	2	0	1	0	28
1100	30	570	1077	2541	0	1	0	0	-0	3
1130	12	255	453	1068	0	0	0	0	-0	2
1170	10	224	380	897	0	0	0	0	-0	1
1200	7	148	255	601	0	0	0	0	-0	1
1300	71	2430	2585	6098	0	5	0	2	-0	3
1650	116	3096	4202	9913	0	6	0	2	-0	38

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-packag
A 950	7.1	90.4	58.15	1194	4.311	36.89 +	.20	.22	.29
B 1050	14.7	96.6	65.16	4806	4.274	36.57 +	.04	.10	.21
C 1100	9.4	99.5	62.01	0	4.274	36.58 +	.10	.14	.23
D 1130	4.0	99.1	58.22	0	4.271	36.55 +	.15	.18	.25
E 1170	3.3	99.3	55.82	0	4.282	36.64 +	.27	.29	.34
F 1200	2.2	99.4	56.58	0	4.288	36.69 +	.21	.23	.29
G 1300	22.6	99.8	35.01	0	4.265	36.50 +	.02	.09	.21
H 1650	36.7	98.2	44.69	0	4.289	36.70 +	.03	.10	.21
Total gas K/Ca =			49.3						

Precisions are 1 sigma, measured in Ma. Measured 40/36 atm = 297.2 +.5
J = 0.004792 + 0.25% (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 = 0.004792 + 0.25% SAMPLE WT = 0.5014 g

TEMP C	Initial & radiogenic 40Ar	Potassium derived 39Ar	Chlorine derived 38Ar	Calcium derived 37Ar	Initial 36Ar	AGE* in Ma	**
950	1.374E-11	2.880E-12	5.836E-15	2.576E-14	4.472E-15	36.89 +	.20
1050	2.612E-11	5.907E-12	2.974E-15	4.714E-14	2.967E-15	36.57 +	.04
1100	1.630E-11	3.793E-12	***	3.180E-14	***	36.58 +	.10
1130	6.865E-12	1.594E-12	***	1.423E-14	***	36.55 +	.15
1170	5.770E-12	1.339E-12	***	1.247E-14	***	36.64 +	.27
1200	3.868E-12	8.967E-13	***	8.241E-15	***	36.69 +	.21
1300	3.891E-11	9.102E-12	***	1.352E-13	***	36.50 +	.02
1650	6.465E-11	1.479E-11	***	1.722E-13	4.037E-15	36.70 +	.03
TOTAL GAS	1.762E-10	4.031E-11	8.810E-15	4.470E-13	1.249E-14	36.63	

92.9% of gas on plateau, steps 1050 through 1650 PLATEAU AGE = 36.57 + .1

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 02/05/91 H89-37 KSPAR #3,4 RD73 16:19:21 9 Feb 1992

TEMP C	% TOT 39Ar	RAD YIELD	APP K/Ca	APP K/Cl	F	AGE (Ma)	intra-sample	precision intra-package	precision inter packa
A 950	7.1	90.4	58.15	1194	4.311	36.89 +	.20	.22	.29
B 1050	14.7	96.6	65.16	4806	4.274	36.57 +	.04	.10	.21
C 1100	9.4	99.5	62.01	0	4.274	36.58 +	.10	.14	.23
D 1130	4.0	99.1	58.22	0	4.271	36.55 +	.15	.18	.25
E 1170	3.3	99.7	55.82	0	4.296	36.76 +	.39	.40	.44
F 1200	2.2	99.3	56.58	0	4.282	36.64 +	.30	.32	.37
G 1300	22.6	99.8	35.01	0	4.265	36.50 +	.02	.09	.21
H 1650	36.7	98.2	44.69	0	4.289	36.70 +	.03	.10	.21
Total gas K/Ca =			49.3						

Precisions are 1 sigma, measured in Ma. Measured 40/36 atm = 297.2 +.5
J = 0.004792 + 0.25% (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 count
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

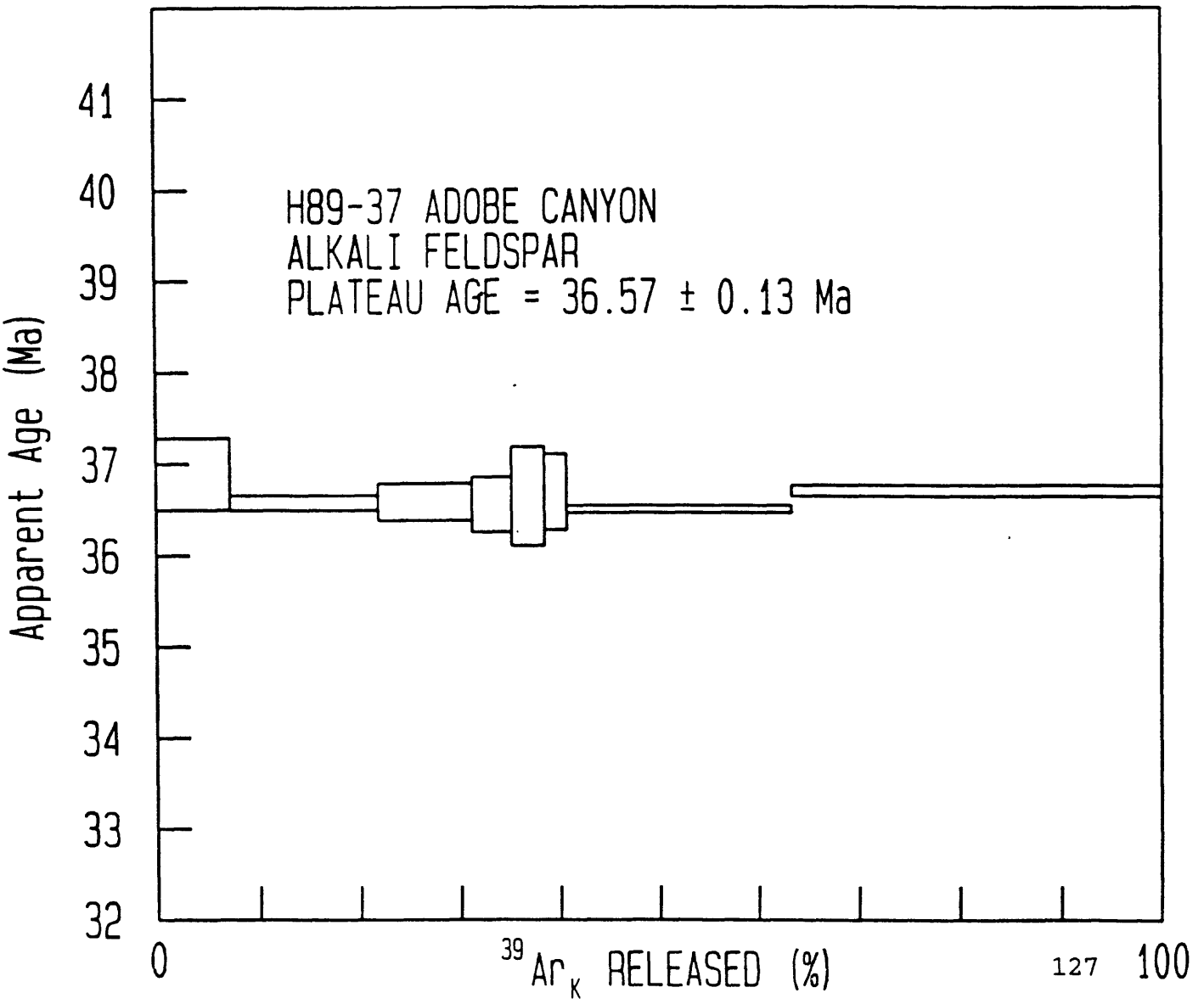
J = 0.004792 + 0.25% SAMPLE WT = 0.5014 g

TEMP C	Initial & radiogenic 40Ar	Potassium derived 39Ar	Chlorine derived 38Ar	Calcium derived 37Ar	Initial 36Ar	AGE* in Ma	**
950	1.374E-11	2.880E-12	5.836E-15	2.576E-14	4.472E-15	36.89 +	.20
1050	2.612E-11	5.907E-12	2.974E-15	4.714E-14	2.967E-15	36.57 +	.04
1100	1.630E-11	3.793E-12	***	3.180E-14	***	36.58 +	.10
1130	6.865E-12	1.594E-12	***	1.423E-14	***	36.55 +	.15
1170	5.770E-12	1.339E-12	***	1.247E-14	***	36.76 +	.39
1200	3.868E-12	8.967E-13	***	8.241E-15	***	36.64 +	.30
1300	3.891E-11	9.102E-12	***	1.352E-13	***	36.50 +	.02
1650	6.465E-11	1.479E-11	***	1.722E-13	4.037E-15	36.70 +	.03
TOTAL GAS	1.762E-10	4.031E-11	8.810E-15	4.470E-13	1.244E-14	36.63	

92.9% of gas on plateau, steps 1050 through 1650 PLATEAU AGE = 36.57 + .1

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 02/05/91 14:44:47 7 Feb 1992 H89-37 R273



v 02/05/91 (40/36in = 295.5)

R A W D A T A

FILE	TEMP	40Ar	39Ar	38Ar	37Ar	36Ar regression	TRAP CURRENT	MANIFOLD OPTION
29273	930	315151	78949	3489	359	54	200	EALL
	+	3963	579	9	8	3		
29274	1020	361619	86468	1136	203	17	200	EALL
	+	640	169	6	16	4		
29275	1100	425649	101878	1327	271	9	200	EALL
	+	832	197	20	9	6		
29276	1150	427293	102306	1335	408	2	200	EALL
	+	417	102	15	15	3		
29277	1220	2042871	488165	6357	1859	30	200	EALL
	+	2756	710	5	6	9		
29278	1270	638076	151644	1961	455	17	200	EALL
	+	1097	34	11	9	5		
29279	1330	698679	165718	2164	468	19	200	EALL
	+	916	107	4	4	9		
29280	1450	264152	62619	808	166	9	200	EALL
	+	359	82	3	12	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
930	28	687	449	1060	0	1	0	0	0	10
1020	31	389	492	1161	0	0	0	0	-0	3
1100	37	519	580	1368	0	1	0	0	-0	2
1150	37	781	582	1373	0	1	0	0	-0	0
1220	176	3565	2778	6553	0	4	0	1	-0	5
1270	55	873	863	2036	0	1	0	0	-0	3
1330	60	899	943	2225	0	1	0	0	-0	3
1450	23	319	356	841	0	0	0	0	-0	2

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-packag
A 930	6.4	94.9	39.14	78	3.776	33.16 +	.45	.45	.48
B 1020	7.0	98.6	75.73	0	4.111	36.07 +	.13	.16	.24
C 1100	8.2	99.4	66.90	0	4.138	36.31 +	.16	.18	.26
D 1150	8.3	99.9	44.62	0	4.157	36.48 +	.09	.13	.22
E 1220	39.4	99.6	46.68	0	4.155	36.45 +	.07	.12	.22
F 1270	12.3	99.2	59.25	0	4.163	36.52 +	.10	.14	.23
G 1330	13.4	99.2	62.90	0	4.170	36.58 +	.15	.18	.26
H 1450	5.1	99.0	67.00	0	4.163	36.52 +	.28	.30	.35
Total gas K/Ca =			54.5						

Precisions are 1 sigma, measured in Ma. Measured 40/36 atm = 297.2 +.5
J = 0.004913 + 0.25% (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

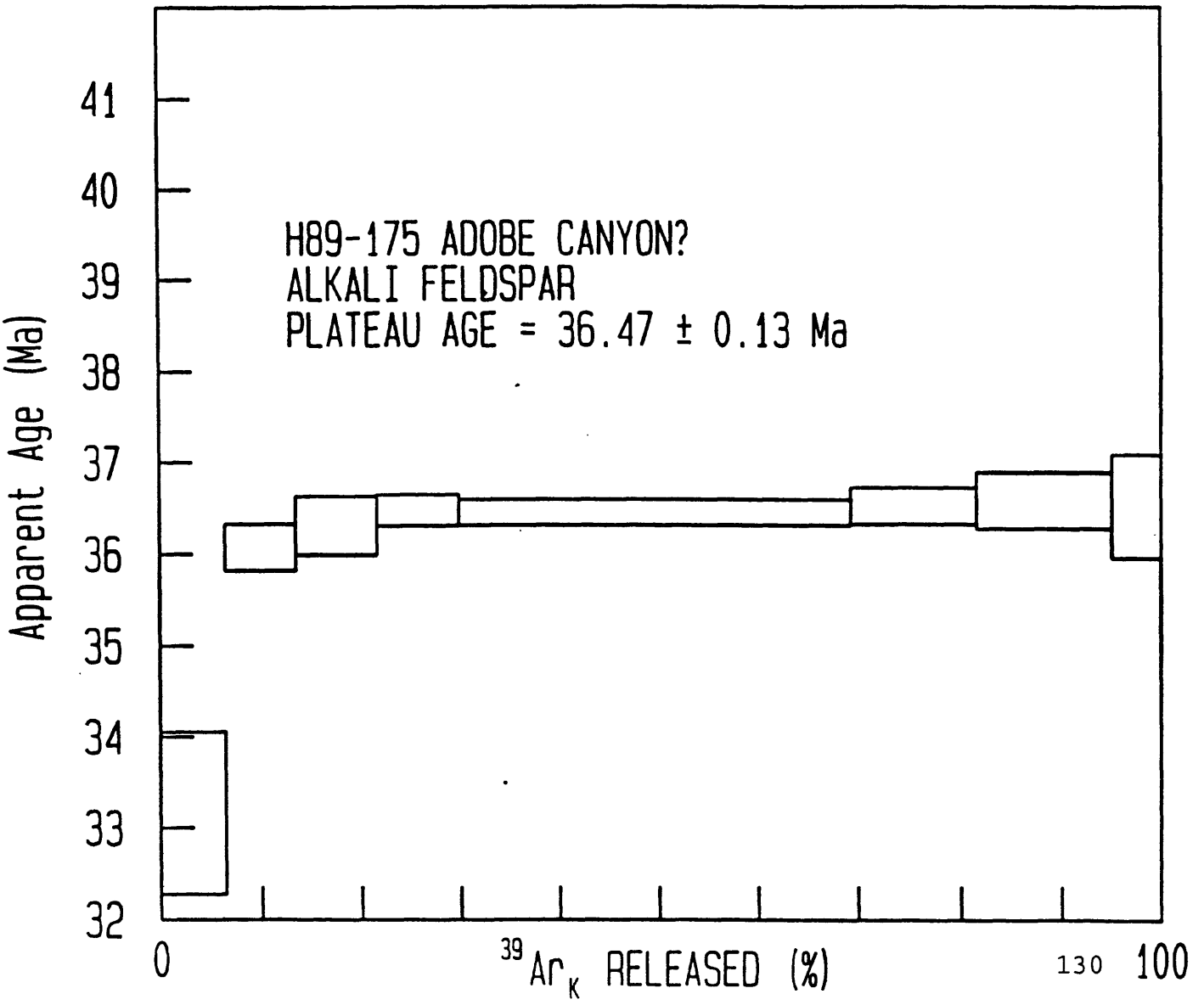
J = 0.004913 + 0.25% SAMPLE WT = 0.5067 g

TEMP C	Initial & radiogenic 40Ar	Potassium derived 39Ar	Chlorine derived 38Ar	Calcium derived 37Ar	Initial 36Ar	AGE* in Ma	**
930	6.294E-12	1.582E-12	4.899E-14	2.101E-14	1.085E-15	33.16 +	.45
1020	7.223E-12	1.732E-12	***	1.190E-14	***	36.07 +	.13
1100	8.501E-12	2.041E-12	***	1.587E-14	***	36.31 +	.16
1150	8.534E-12	2.050E-12	***	2.389E-14	***	36.48 +	.09
1220	4.080E-11	9.781E-12	***	1.089E-13	***	36.45 +	.07
1270	1.274E-11	3.038E-12	***	2.667E-14	***	36.52 +	.10
1330	1.395E-11	3.320E-12	***	2.745E-14	***	36.58 +	.15
1450	5.276E-12	1.255E-12	***	9.738E-15	***	36.52 +	.28
TOTAL GAS	1.033E-10	2.480E-11	4.899E-14	2.455E-13	3.100E-15	36.24	

86.6% of gas on plateau, steps 1100 through 1450 PLATEAU AGE = 36.47 + .1

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 02/05/91 12:05:42 12 Feb 1992 H89-175 KSPAR #17,18 RD81



v 02/05/91 (40/36in = 295.5)

R A W D A T A

FILE	TEMP	40Ar	39Ar	38Ar	37Ar	36Ar	TRAP CURRENT	MANIFOLD OPTION
					ä	*		
32435	900	163248	32219	428	205	64	200	EALL
	▪	774	78	6	4	4		
32436	1025	285562	60490	785	367	30	200	EALL
	▪	817	78	7	5	4		
32437	1120	161098	34515	456	212	15	200	EALL
	▪	694	74	4	5	5		
32438	1200	317317	68098	891	401	17	200	EALL
	▪	947	83	7	7	5		
32439	1280	260833	55193	722	301	20	200	EALL
	▪	741	35	6	6	7		
32440	1380	110675	20546	146	111	53	200	EALL
	▪	692	28	9	6	5		

* 36Ar peak values less than 10 are means those above 10 are from linear regressions

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
900	36	4060	183	433	0	3	0	1	0	12
1025	68	7272	344	813	0	5	0	2	-0	5
1120	39	4199	197	464	0	3	0	1	-0	3
1200	76	7948	388	915	0	6	0	2	-0	3
1280	62	5958	314	741	0	4	0	2	-0	3
1380	23	2194	117	276	0	2	0	1	-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 900	11.9	88.6	3.92	10127	4.472	35.66 ▪	.35	.36	.40
B 1025	22.3	97.1	4.11	0	4.565	36.39 ▪	.19	.21	.28
C 1120	12.7	97.4	4.06	0	4.527	36.09 ▪	.38	.39	.43
D 1200	25.1	98.6	4.23	0	4.576	36.48 ▪	.19	.21	.28
E 1280	20.4	97.9	4.58	0	4.608	36.73 ▪	.30	.31	.36
F 1380	7.6	85.9	4.63	0	4.612	36.76 ▪	.59	.60	.63
Total gas K/Ca =			4.2						

Precisions are 1 sigma, measured in Ma. Measured 40/36 atm = 297.3 ▪.5
J = 0.004464 ▪ 0.25% (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: 2.07 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

v 06/13/92 10:04:51 24 Feb 1993

H87-161 #5 RD86 KSPAR

J = 0.004464 ▪ 0.25% SAMPLE WT = 0.0251 g

TEMP C	Initial & radiogenic 40Ar	Potassium derived 39Ar	Chlorine derived 38Ar	Calcium derived 37Ar	Initial 36Ar	AGE* in Ma	**
900	4.979E-12	9.863E-13	***	1.308E-13	1.922E-15	35.66 ▪	.35
1025	8.708E-12	1.852E-12	***	2.343E-13	***	36.39 ▪	.19
1120	4.913E-12	1.057E-12	***	1.353E-13	***	36.09 ▪	.38
1200	9.677E-12	2.085E-12	***	2.561E-13	***	36.48 ▪	.19
1280	7.954E-12	1.690E-12	***	1.920E-13	***	36.73 ▪	.30
1380	3.376E-12	6.289E-13	***	7.069E-14	1.608E-15	36.76 ▪	.59
TOTAL GAS	3.961E-11	8.297E-12	***	1.019E-12	5.875E-15	36.39	

88.1% of gas on plateau, steps 1025 through 1380 PLATEAU AGE = 36.46 + .13

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.

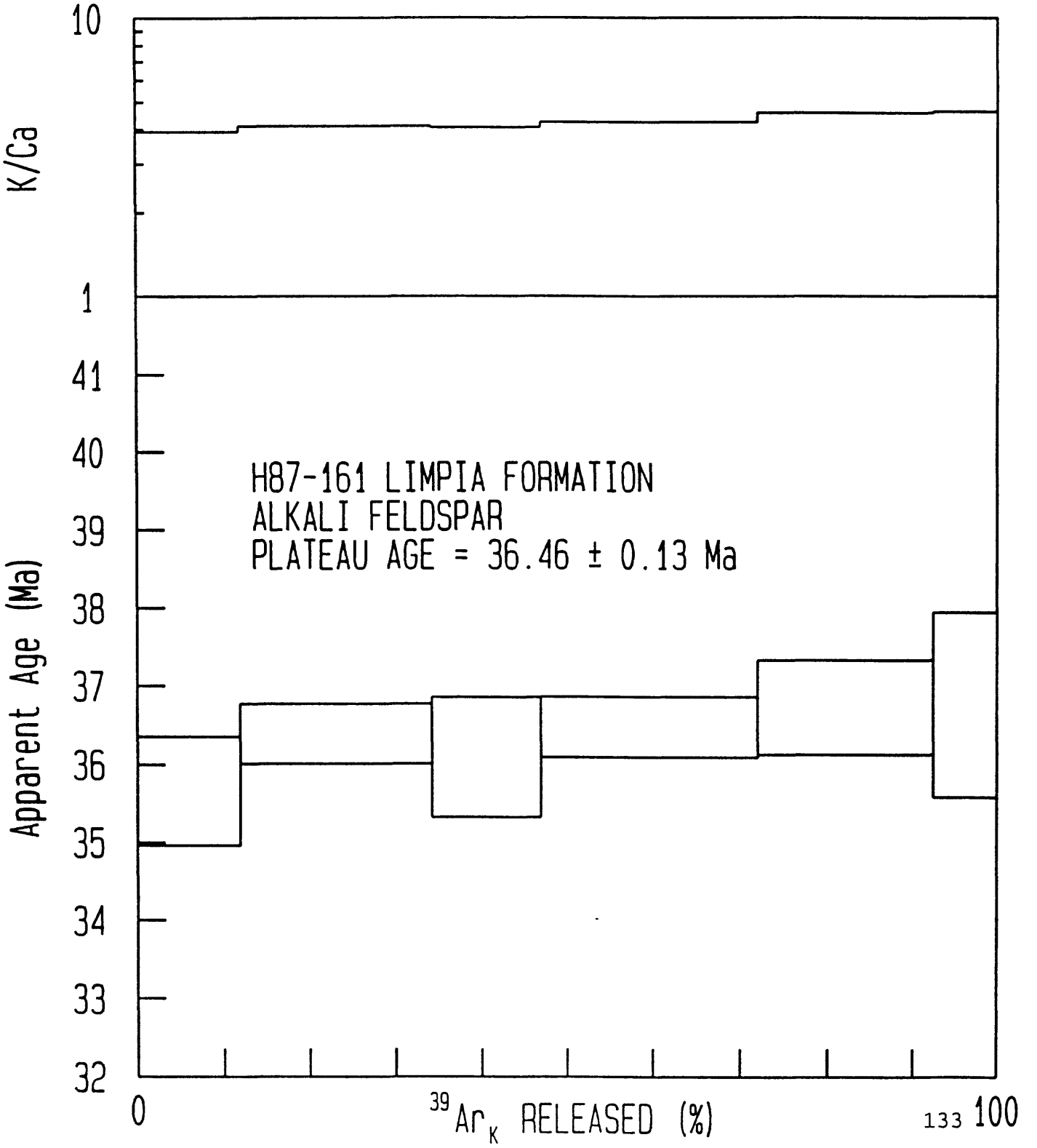
*** below detection limit

v 06/13/92

"Tube" Blank = 40 = 1606 ± 663

36 = 10.3 ± 3.8

v 06/13/92 10:10:45 24 Feb 1993 H87-161 #5 RD86 KSPAR



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

22-7 GOMEZ TLFF; 51,52:RD56

R A W D A T A

FILE	TEMP	40Ar	39Ar	38Ar	37Ar	36Ar mean	TRAP CURRENT	MANIFOLD OPTION
	900	1040104	246685	3207	373	50	200	ALL
	±	395	137	15	5	6		
	1075	2883468	688951	8872	590	45	200	ALL
	±	1051	200	14	18	10		
	1120	1888513	451380	5803	367	25	200	ALL
	±	974	218	19	16	15		
	1150	1588350	379647	4849	304	11	200	ALL
	±	465	132	12	10	9		
	1180	1239311	295982	3801	221	9	200	ALL
	±	504	85	6	10	8		
	1220	1262032	300561	3856	207	19	200	ALL
	±	536	241	8	7	11		
	1300	1019785	241917	3088	163	10	200	ALL
	±	232	79	17	10	2		

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
900	76	517	1403	3309	0	1	0	0	-0	9
1075	213	818	3918	9243	0	1	0	0	-0	8
1120	140	510	2567	6055	0	1	0	0	-0	5
1150	117	423	2159	5093	0	0	0	0	-0	2
1180	92	308	1683	3971	0	0	0	0	-0	2
1220	93	288	1709	4032	0	0	0	0	-0	3
1300	75	227	1376	3245	0	0	0	0	-0	2

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	9.5	98.6	143.95	0	4.146	36.63	±	.07	.12	.22
B	1075	26.4	99.5	254.24	0	4.156	36.72	±	.04	.10	.21
C	1120	17.3	99.6	267.03	0	4.157	36.73	±	.09	.13	.22
D	1150	14.5	99.8	270.91	0	4.165	36.80	±	.06	.11	.22
E	1180	11.4	99.8	290.40	0	4.168	36.82	±	.07	.12	.22
F	1220	11.5	99.6	315.68	0	4.170	36.85	±	.10	.13	.23
G	1300	9.3	99.7	322.91	0	4.193	37.04	±	.03	.10	.21
Total gas K/Ca =				266.0							

Precisions are 1 sigma, measured in Ma. Measured 40/36 atm = 296.5 ±.5
J = 0.004948 ± 0.25% (intra-package) ± 0.50% (inter-package)
Trap current factors- 40: 1 100: .43 200: 1
Manifold factors- ALL: 1 SPLIT 1: 3.6 SPLIT 2: 12.96 SPLIT 3: 46.656
Sensitivity = 1.650E-17 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

22-7 GOMEZ TUFF; 5.,52:RB56

J = 0.00.948 ± 0.25% SAMPLE WT = 0.5615 g

TEMP C	Initial & radiogenic 40Ar	Potassium derived 39Ar	Chlorine derived 38Ar	Calcium derived 37Ar	Initial 36Ar	AGE* in Ma	**
900	1.714E-11	4.075E-12	***	1.472E-14	8.306E-16	36.63 ±	.12
1075	4.751E-11	1.138E-11	***	2.328E-14	7.410E-16	36.72 ±	.10
1120	3.112E-11	7.456E-12	***	1.452E-14	***	36.73 ±	.13
1150	2.617E-11	6.271E-12	***	1.204E-14	***	36.80 ±	.11
1180	2.042E-11	4.889E-12	***	8.755E-15	***	36.82 ±	.12
1220	2.080E-11	4.965E-12	***	8.178E-15	***	36.85 ±	.13
1300	1.680E-11	3.996E-12	***	6.435E-15	***	37.04 ±	.10
TOTAL GAS	1.800E-10	4.303E-11	***	8.792E-14	2.787E-15	36.78	

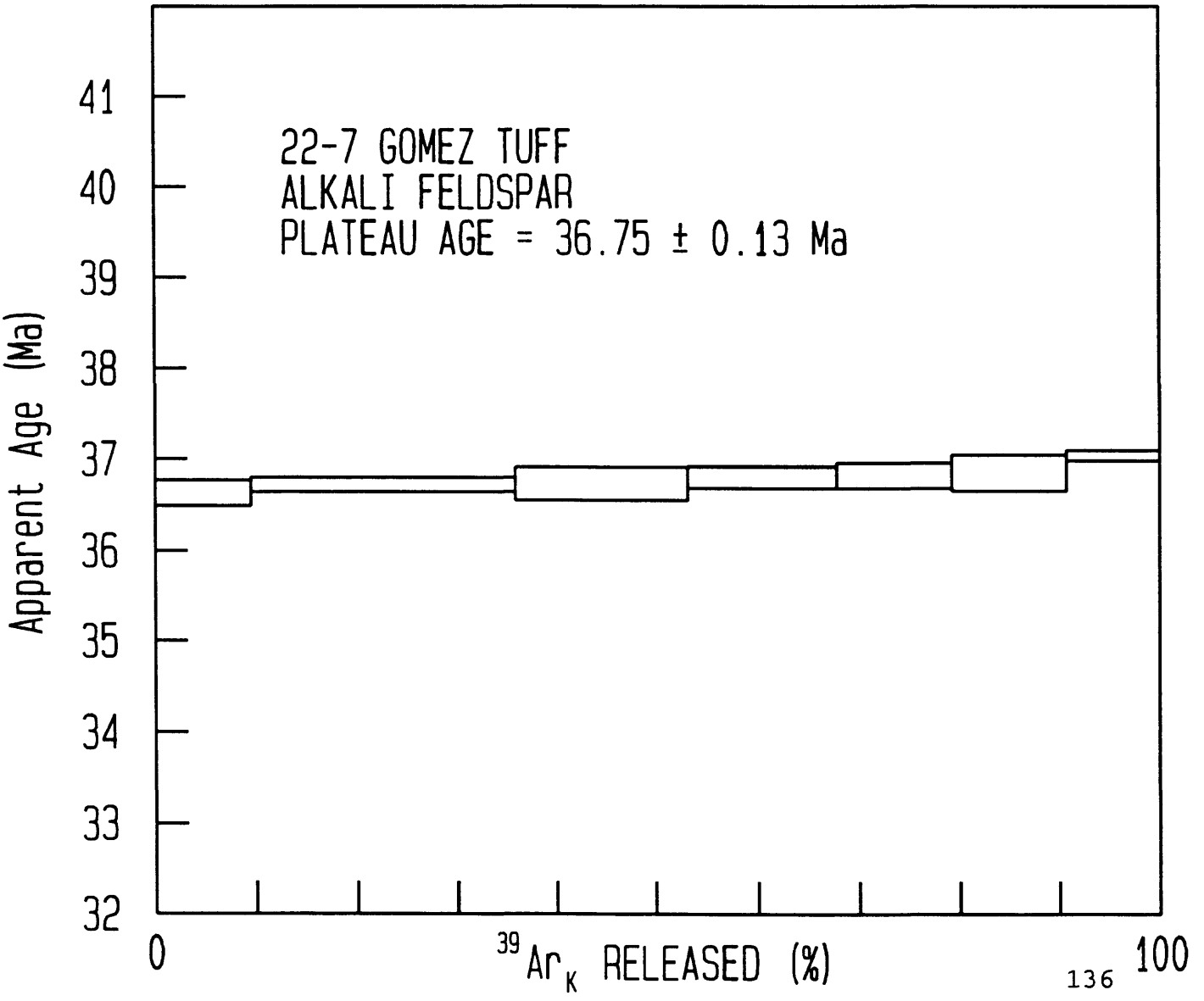
K/Ca = 266.0

90.7% of gas on plateau, steps 900 through 1220 PLATEAU AGE = 36.75 ± .09

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 2/18/89

v 08/23/93 14:52:51 7 Dec 1993



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v 08/23/93 (40/36in = 295.5)

v 06/13/92 GOMEZ 7 KSPAR #24RD60 22:45:37 17 Apr 1993

R A W D A T A

FILE	TEMP	40Ar	39Ar	38Ar	37Ar	36Ar *	TRAP CURRENT	MANIFOLD OPTION
29445	1020	580257	137866	1964	0	30	200	ALL
	±	893	112	19	0	3		
29446	1100	602872	145330	1884	0	6	200	ALL
	±	264	43	13	0	7		
29447	1150	455247	109604	1411	0	6	200	ALL
	±	971	250	9	0	6		
29448	1180	425813	102805	1338	0	5	200	ALL
	±	169	64	11	0	2		
29449	1220	539300	129770	1694	0	7	200	ALL
	±	920	139	6	0	7		
29450	1270	838715	201541	2615	0	16	200	ALL
	±	119	66	8	0	6		
29451	1330	1884353	450994	5853	0	32	200	ALL
	±	1646	610	4	0	5		
29452	1450	1093916	261207	3359	0	16	200	ALL
	±	598	148	2	0	4		

* 36Ar peak values less than 30 are means those above 30 are from linear regressions

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
1020	977	0	790	1863	0	0	0	0	0	6
1100	1030	0	833	1964	0	0	0	0	-0	1
1150	777	0	628	1481	0	0	0	0	-0	1
1180	729	0	589	1389	0	0	0	0	-0	1
1220	920	0	743	1754	0	0	0	0	-0	1
1270	1429	0	1155	2724	0	0	0	0	-0	3
1330	3197	0	2584	6095	0	0	0	0	-0	6
1450	1852	0	1496	3530	0	0	0	0	-0	3

All values in counts, corrected for mass discrimination

v 06/13/92 GOMEZ 7 KSPAR #24RD60 22:45:39 17 Apr 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 1020	9.0	98.5	0.00	3013	4.104	36.87 ±	.08	.12	.22
B 1100	9.4	99.7	0.00	0	4.095	36.79 ±	.13	.16	.24
C 1150	7.1	99.6	0.00	0	4.095	36.79 ±	.17	.19	.27
D 1180	6.7	99.7	0.00	0	4.087	36.72 ±	.05	.10	.21
E 1220	8.4	99.6	0.00	0	4.099	36.83 ±	.16	.18	.26
F 1270	13.1	99.4	0.00	0	4.097	36.81 ±	.08	.12	.22
G 1330	29.3	99.5	0.00	0	4.116	36.98 ±	.04	.10	.21
H 1450	17.0	99.6	0.00	0	4.129	37.09 ±	.04	.10	.21
Total gas K/Ca =			0.0						

Precisions are 1 sigma, measured in Ma. Measured 40/36 atm = 297.2 ±.5
J = 0.005031 ± 0.25% (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

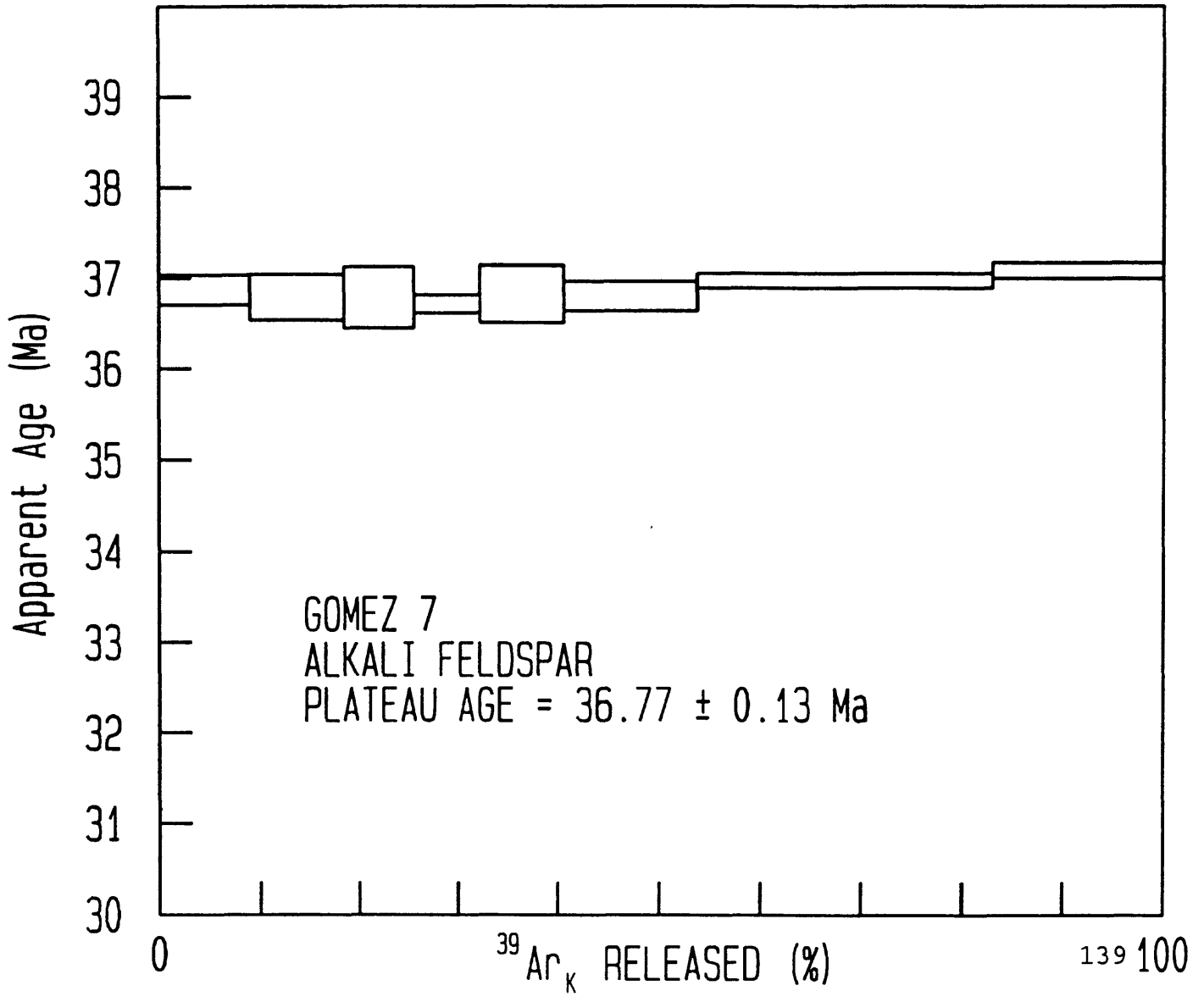
J = 0.005031 ± 0.25% SAMPLE WT = 0.3302 g

TEMP C	Initial & radiogenic 40Ar	Potassium derived 39Ar	Chlorine derived 38Ar	Calcium derived 37Ar	Initial 36Ar	AGE* in Ma	**
1020	5.795E-12	1.390E-12	1.117E-15	***	***	36.87 ±	.08
1100	6.020E-12	1.466E-12	***	***	***	36.79 ±	.13
1150	4.546E-12	1.105E-12	***	***	***	36.79 ±	.17
1180	4.252E-12	1.037E-12	***	***	***	36.72 ±	.05
1220	5.386E-12	1.309E-12	***	***	***	36.83 ±	.16
1270	8.376E-12	2.033E-12	***	***	***	36.81 ±	.08
1330	1.882E-11	4.548E-12	***	***	***	36.98 ±	.04
1450	1.092E-11	2.634E-12	***	***	***	37.09 ±	.04
TOTAL GAS	6.412E-11	1.552E-11	1.117E-15	***	1.187E-15	36.90	

53.7% of gas on plateau, steps 1020 through 1270 PLATEAU AGE = 36.77 + .13
50.8% of gas on plateau, steps 1220 through 1330 PLATEAU AGE = 36.93 + .13

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 22:49:49 17 Apr 1993 GOMEZ 7 KSPAR #24RD60



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

R A W D A T A

FILE	TEMP	40Ar	39Ar	38Ar	37Ar	36Ar mean	TRAP CURRENT	MANIFOLD OPTION
17711:	900	1095726	255618	3326	609	52	200	ALL
	±	361	125	33	9	7		
17713:	1075	2549394	599671	7741	937	60	200	ALL
	±	2032	179	39	7	3		
17714:	1120	1636692	382699	4929	611	75	200	ALL
	±	449	103	49	13	10		
17715:	1150	1514767	353483	4544	497	80	200	ALL
	±	513	124	45	6	14		
17716:	1180	1627636	380831	4910	453	60	200	ALL
	±	637	169	49	8	10		
17717:	1220	1478716	346354	4446	314	38	200	ALL
	±	1070	210	44	11	15		
17718:	1300	969738	226037	2905	211	28	200	ALL
	±	282	87	87	13	6		

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	K-derived 38Ar	K-derived 37Ar	Ca-derived 39Ar	Ca-derived 38Ar	Ca-derived 36Ar	Cl-der 36Ar	Initial 38Ar
900	77	821	1454	3429	0	1	0	0	-0	10
1075	181	1260	3410	8045	0	1	0	1	-0	11
1120	116	825	2176	5134	0	1	0	0	-0	14
1150	107	671	2010	4742	0	1	0	0	-0	15
1180	115	612	2166	5109	0	1	0	0	-0	11
1220	105	425	1970	4646	0	0	0	0	-0	7
1300	69	286	1285	3032	0	0	0	0	-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)		precision intra-sample	precision intra-package	precision inter-package
A 900	10.6	98.6	92.80	0	4.216	36.88	±	.07	.12	.22
B 1075	23.6	99.3	141.75	0	4.212	36.83	±	.03	.10	.21
C 1120	15.6	98.6	138.33	0	4.206	36.81	±	.07	.12	.22
D 1150	13.9	98.4	157.15	0	4.208	36.80	±	.11	.14	.23
E 1180	15.6	98.9	185.78	0	4.217	36.88	±	.07	.12	.22
F 1220	13.6	99.2	243.56	0	4.227	36.97	±	.11	.15	.24
G 1300	8.9	99.1	235.79	0	4.243	37.11	±	.07	.12	.22
Total gas K/Ca =			167.3							

Precisions are 1 sigma, measured in Ma. Measured 40/36 atm = 296.5 ±.5
J = 0.004898 ± 0.25% (intra-package) ± 0.50% (inter-package)
Trap current factors- 40: 1 100: .43 200: 1
Manifold factors- ALL: 1 SPLIT 1: 3.6 SPLIT 2: 12.96 SPLIT 3: 46.656
Sensitivity = 1.650E-17 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

GOMEZ 4; 45,46 RD56

J = 0.004898 ± 0.25% SAMPLE WT = 0.5621 g

TEMP C	Initial & radiogenic 40Ar*	Potassium derived 39Ar	Chlorine derived 38Ar	Calcium derived 37Ar	Initial 36Ar	AGE* in Ma	**
900	1.806E-11	4.223E-12	***	2.365E-14	8.531E-16	36.88 ±	.12
1075	4.201E-11	9.906E-12	***	3.634E-14	9.792E-16	36.83 ±	.10
1120	2.697E-11	6.322E-12	***	2.376E-14	1.237E-15	36.81 ±	.12
1150	2.496E-11	5.839E-12	***	1.932E-14	1.325E-15	36.80 ±	.14
1180	2.682E-11	6.291E-12	***	1.761E-14	9.939E-16	36.88 ±	.12
1220	2.437E-11	5.721E-12	***	1.222E-14	***	36.97 ±	.15
1300	1.598E-11	3.734E-12	***	8.234E-15	***	37.11 ±	.12
TOTAL GAS	1.792E-10	4.204E-11	***	1.411E-13	6.471E-15	36.88	

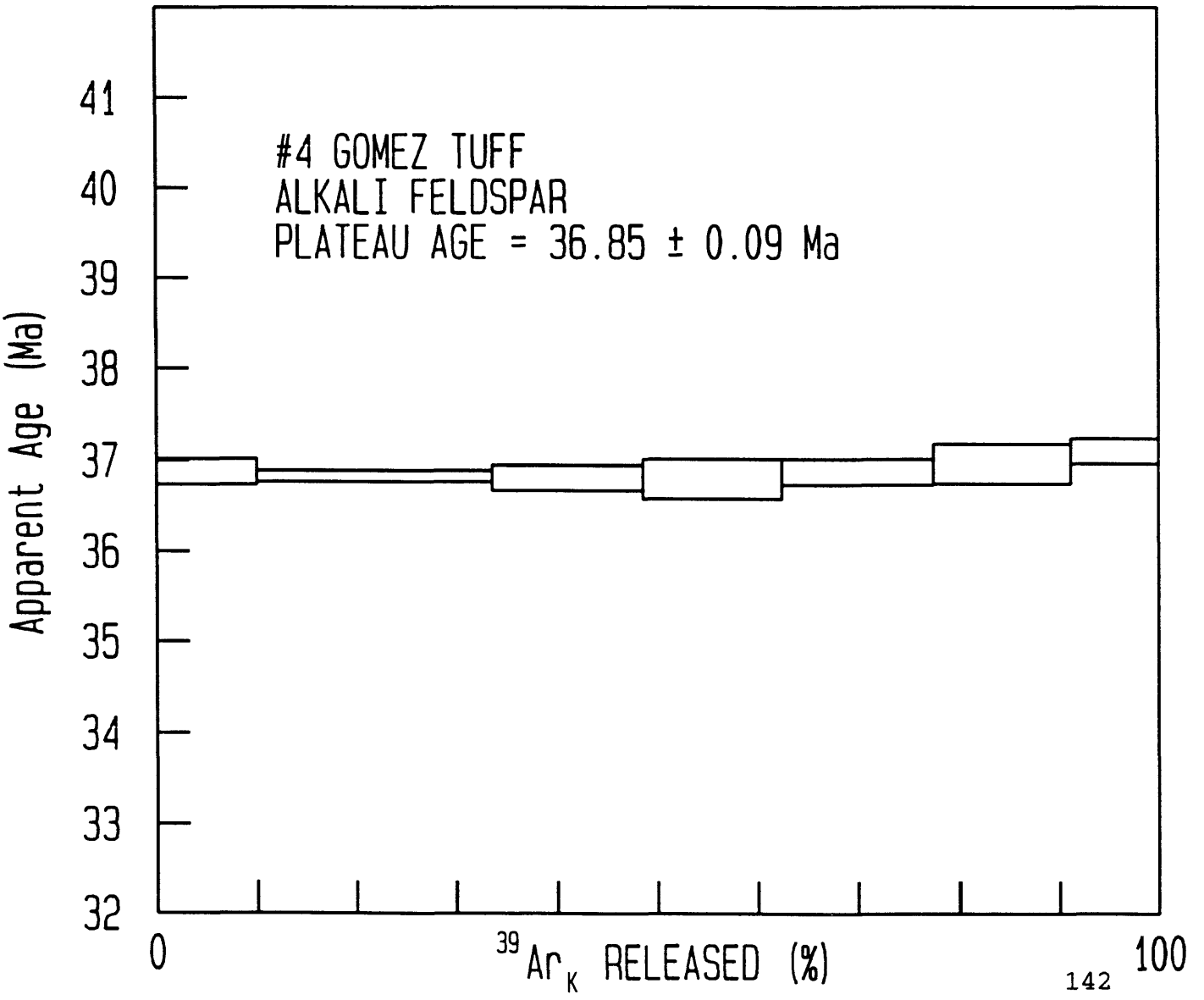
K/Ca = 167.3

91.1% of gas on plateau, steps 900 through 1220 PLATEAU AGE = 36.85 ± .09

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 2/18/89

v 08/23/93 15:04:04 7 Dec 1993



v 08/23/93 (40/36in = 295.5)

R A W D A T A

FILE	TEMP	40Ar	39Ar	38Ar	37Ar	36Ar mean	TRAP CURRENT	MANIFOLD OPTION
	900	1112506	260255	3381	329	65	200	ALL
	±	445	105	18	11	14		
	1075	3000955	709938	9147	749	57	200	ALL
	±	797	318	28	12	14		
	1120	1978894	467865	6015	450	31	200	ALL
	±	837	159	20	5	10		
	1150	1389845	328124	4234	316	19	200	ALL
	±	583	126	15	2	12		
	1180	1234174	290584	3741	269	22	200	ALL
	±	585	179	17	19	6		
	1220	1084556	254533	3269	240	18	200	ALL
	±	371	94	7	11	12		
	1300	892604	208397	2689	212	26	200	ALL
	±	402	112	23	10	5		

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	K-derived 38Ar	K-derived 37Ar	Ca-derived 39Ar	Ca-derived 38Ar	Ca-derived 36Ar	Cl-der 36Ar	Initial 38Ar
900	82	470	1480	3491	0	1	0	0	-0	12
1075	224	1071	4037	9524	0	1	0	0	-0	11
1120	148	644	2661	6277	0	1	0	0	-0	6
1150	104	453	1866	4402	0	1	0	0	-0	4
1180	92	386	1652	3898	0	0	0	0	-0	4
1220	80	345	1447	3415	0	0	0	0	-0	3
1300	66	305	1185	2796	0	0	0	0	-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)		precision intra-sample	precision intra-package	precision inter-package
A	900	10.3	98.3	169.15	0	4.190	36.64	±	.14	.17	.25
B	1075	28.2	99.4	202.53	0	4.193	36.66	±	.05	.11	.21
C	1120	18.6	99.5	222.06	0	4.200	36.72	±	.06	.11	.21
D	1150	13.0	99.6	221.45	0	4.208	36.79	±	.10	.13	.23
E	1180	11.5	99.5	230.41	0	4.214	36.84	±	.06	.11	.22
F	1220	10.1	99.5	225.86	0	4.230	36.98	±	.12	.15	.24
G	1300	8.3	99.1	209.27	0	4.236	37.03	±	.07	.11	.22
Total gas K/Ca =				211.3							

Precisions are 1 sigma, measured in Ma. Measured 40/36 atm = 296.5 ±.5
J = 0.004296 ± 0.25% (intra-package) ± 0.50% (inter-package)
Trap current factors- 40: 1 100: .43 200: 1
Manifold factors- ALL: 1 SPLIT 1: 3.6 SPLIT 2: 12.96 SPLIT 3: 46.656
Sensitivity = 1.650E-17 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

GOMEZ 3; 47,48:RD56

J = 0.004896 ± 0.25% SAMPLE WT = 0.5577 g

TEMP C	Initial & radiogenic 40Ar	Potassium derived 39Ar	Chlorine derived 38Ar	Calcium derived 37Ar	Initial 36Ar	AGE* in Ma	**
900	1.833E-11	4.299E-12	***	1.322E-14	1.073E-15	36.64 ±	.17
1075	4.945E-11	1.173E-11	***	3.011E-14	9.362E-16	36.66 ±	.11
1120	3.261E-11	7.729E-12	***	1.810E-14	***	36.72 ±	.11
1150	2.290E-11	5.420E-12	***	1.273E-14	***	36.79 ±	.13
1180	2.034E-11	4.800E-12	***	1.083E-14	***	36.84 ±	.11
1220	1.787E-11	4.205E-12	***	9.680E-15	***	36.98 ±	.15
1300	1.471E-11	3.443E-12	***	8.554E-15	***	37.03 ±	.11
TOTAL GAS	1.762E-10	4.162E-11	***	1.032E-13	3.915E-15	36.77	

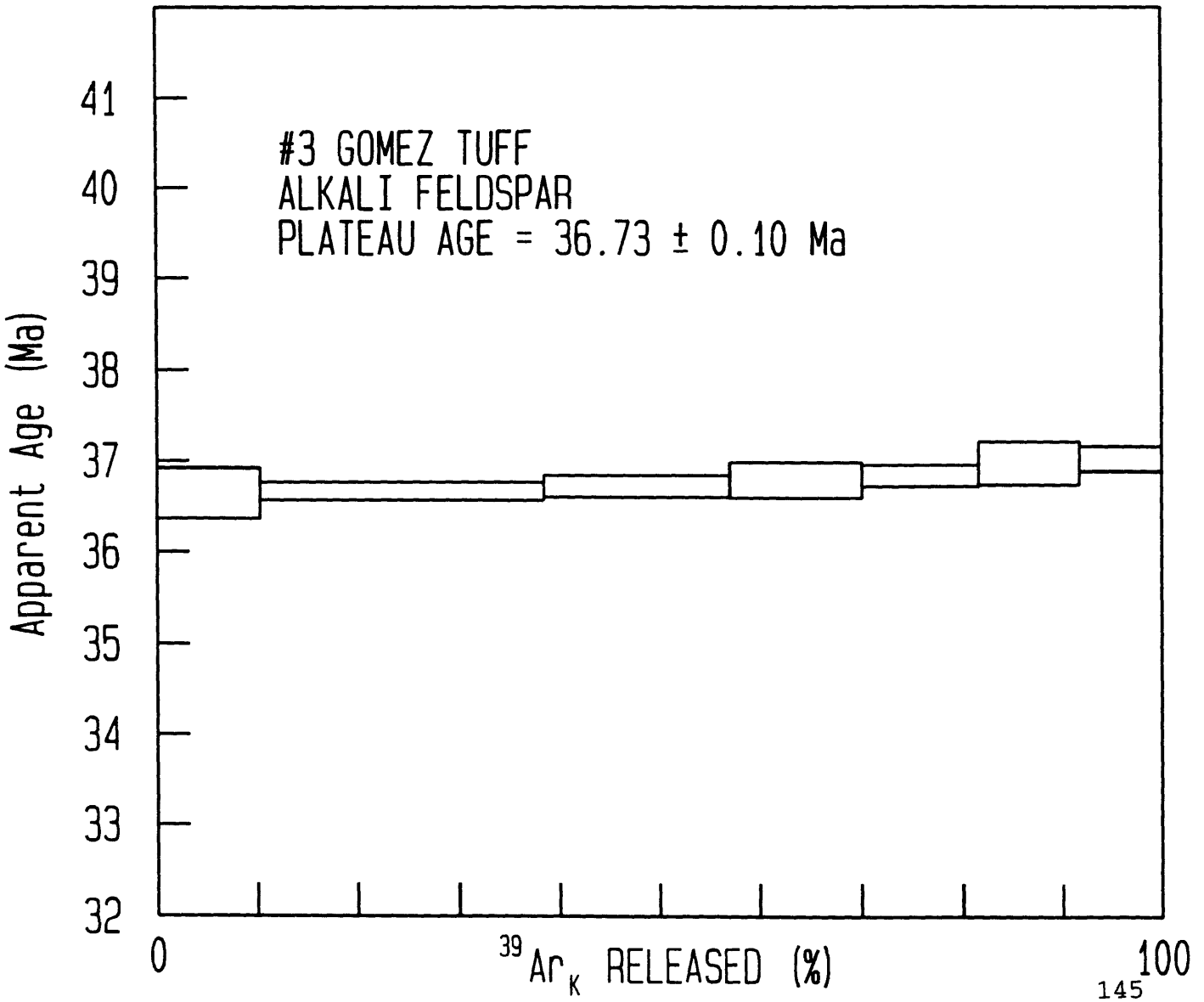
K/Ca = 211.3

81.6% of gas on plateau, steps 900 through 1180 PLATEAU AGE = 36.73 ± .10
53.2% of gas on plateau, steps 1120 through 1220 PLATEAU AGE = 36.80 ± .10

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 2/18/89

v 08/23/93 15:15:56 7 Dec 1993



v 08/23/93 (40/36in = 295.5)

GOMEZ 6, #73,74;RD56,BALMORHER

R A W D A T A

FILE	TEMP	40Ar	39Ar	38Ar	37Ar	36Ar mean	TRAP CURRENT	MANIFOLD OPTION
17705:	1125	4406905	1019478	13096	1303	218	200	ALL
	±	2243	364	39	10	15		
17706:	1180	2324170	538727	6925	673	63	200	ALL
	±	1097	152	35	16	13		
17707:	1220	1555846	356020	4574	425	42	200	ALL
	±	786	131	46	7	19		
17708:	1240	822392	184834	2372	186	27	200	ALL
	±	245	47	71	8	5		
17709:	1270	456516	101751	1295	107	11	200	ALL
	±	73	45	39	14	5		
17710:	1300	160335	36778	503	41	8	200	ALL
	±	60	19	25	10	7		
17711:	1550	45267	9291	113	6	15	200	ALL
	±	38	8	23	12	4		

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	K-derived 38Ar	K-derived 37Ar	Ca-derived 39Ar	Ca-derived 38Ar	Ca-derived 36Ar	Cl-der 36Ar	Initial 38Ar
1125	307	1744	5797	13677	0	2	0	1	-0	41
1180	162	902	3063	7227	0	1	0	0	-0	12
1220	107	570	2025	4776	0	1	0	0	-0	8
1240	56	249	1051	2480	0	0	0	0	-0	5
1270	31	143	579	1365	0	0	0	0	-0	2
1300	11	55	209	493	0	0	0	0	0	2
1550	3	9	53	125	0	0	0	0	-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 1125	45.4	98.5	173.78	0	4.249	37.29 ±	.04	.10	.21
B 1180	24.0	99.2	177.64	0	4.269	37.46 ±	.06	.11	.22
C 1220	15.8	99.2	185.69	0	4.325	37.94 ±	.14	.17	.25
D 1240	8.2	99.3	220.47	0	4.395	38.56 ±	.08	.12	.23
E 1270	4.5	99.3	211.68	0	4.443	38.97 ±	.12	.15	.25
F 1300	1.6	98.4	200.73	7705	4.281	37.57 ±	.48	.49	.52
G 1550	.4	89.9	322.51	0	4.370	38.34 ±	.99	1.00	1.01
Total gas K/Ca =			183.2						

Precisions are 1 sigma, measured in Ma. Measured 40/36 atm = 296.5 ±.5
J = 0.004915 ± 0.25% (intra-package) ± 0.50% (inter-package)
Trap current factors- 40: 1 100: .43 200: 1
Manifold factors- ALL: 1 SPLIT 1: 3.6 SPLIT 2: 12.96 SPLIT 3: 46.656
Sensitivity = 1.650E-17 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-05

GOMEZ 6, #7?,74;RD56,BALMORHEA

J = 0.004915 ± 0.25% SAMPLE WT = 0.5602 g

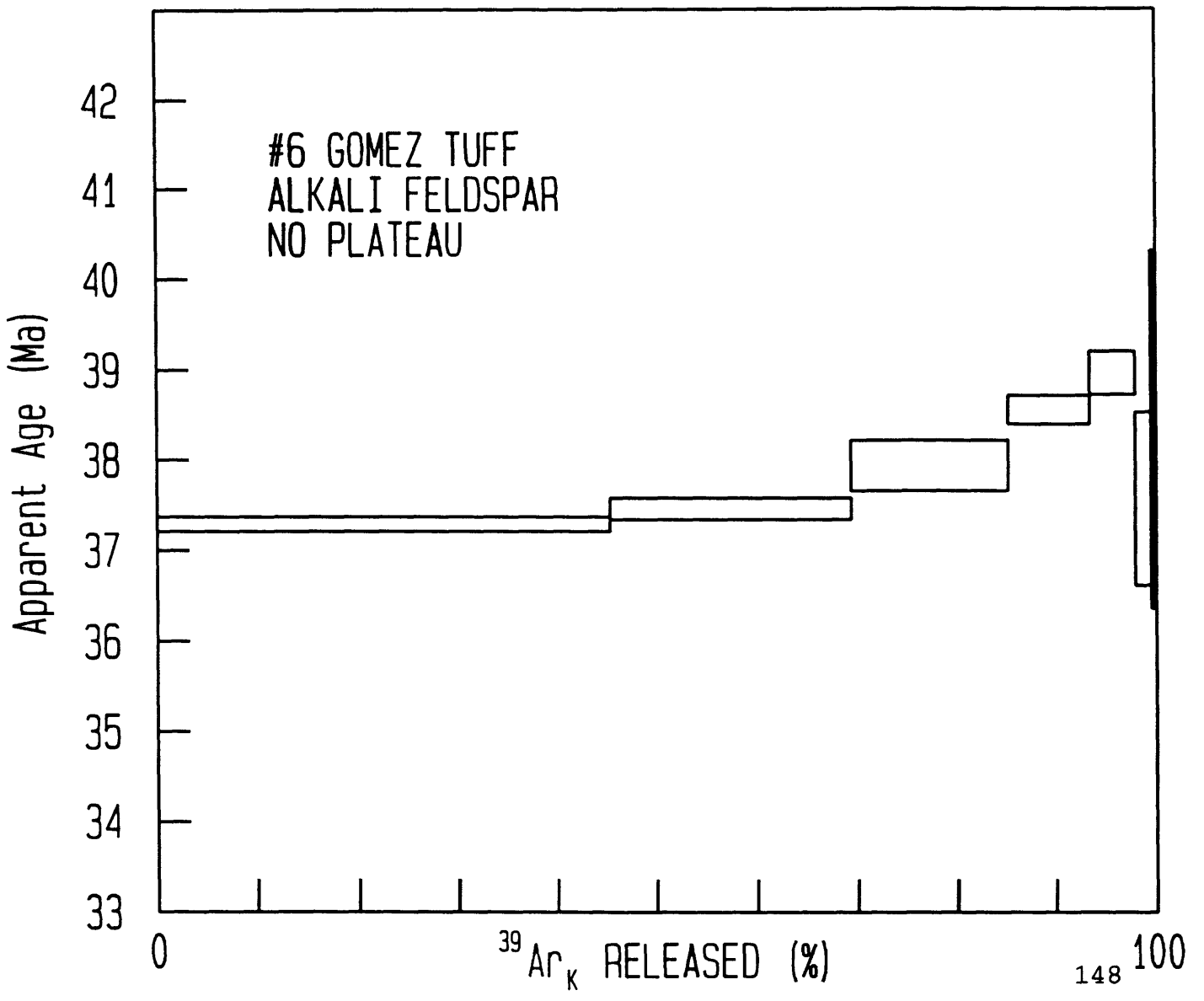
TEMP C	Initial & radiogenic 40Ar	Potassium derived 39Ar	Chlorine derived 38Ar	Calcium derived 37Ar	Initial 36Ar	AGE* in Ma	**
1125	7.262E-11	1.684E-11	***	5.039E-14	3.598E-15	37.29 ±	.10
1180	3.830E-11	8.899E-12	***	2.605E-14	1.033E-15	37.46 ±	.11
1220	2.564E-11	5.881E-12	***	1.647E-14	6.896E-16	37.94 ±	.17
1240	1.355E-11	3.053E-12	***	7.201E-15	***	38.56 ±	.12
1270	7.523E-12	1.681E-12	***	4.129E-15	***	38.97 ±	.15
1300	2.642E-12	6.075E-13	***	1.574E-15	***	37.57 ±	.49
1550	7.460E-13	1.535E-13	***	***	***	38.34 ±	1.00
TOTAL GAS	1.610E-10	3.712E-11	***	1.061E-13	6.346E-15	37.62	
	K/Ca = 183.2						

69.3% of gas on plateau, steps 1125 through 1180 PLATEAU AGE = 37.35 ± .13

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 2/18/89

v 08/23/93 15:30:39 7 Dec 1993



v 08/23/93 (40/36in = 295.5)

v 02/05/91 H87-154B 11:45:25 7 Feb 1992

R A W D A T A

FILE	TEMP	40Ar	39Ar	38Ar	37Ar	36Ar regression	TRAP CURRENT	MANIFOLD OPTION
24449	950	452052	96388	1302	842	124	200	EALL
	+	238	9	26	4	5		
24450	1050	863905	200403	2650	221	29	200	EALL
	+	513	140	6	9	11		
24451	1100	905040	210393	2774	258	15	200	EALL
	+	466	200	4	6	8		
24452	1130	791800	184018	2402	209	15	200	EALL
	+	315	96	13	7	10		
24453	1170	845262	196386	2575	203	7	200	EALL
	+	304	91	13	20	10		
24454	1200	715879	166364	2184	194	1	200	EALL
	+	262	108	15	7	7		
24455	1300	2012512	467569	6167	554	3	200	EALL
	+	1634	413	18	5	6		
24456	1650	1064820	241547	3173	309	81	200	EALL
	+	193	47	7	10	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
950	11	349	548	1294	0	1	0	0	0	23
1050	24	92	1140	2690	0	0	0	0	-0	5
1100	25	107	1197	2824	0	0	0	0	-0	3
1130	22	87	1047	2470	0	0	0	0	-0	3
1170	23	85	1117	2636	0	0	0	0	-0	1
1200	20	81	946	2233	0	0	0	0	-0	0
1300	56	231	2660	6275	0	1	0	0	-0	1
1650	29	129	1374	3242	0	0	0	0	-0	15

All values in counts, corrected for mass discrimination

v 02/05/91 H87-154B 11:45:27 7 Feb 1992

	TEMP C	% TOT 39Ar	RAD YIELD	APP K/Ca	APP K/Cl	F	AGE (Ma)	precision intra-sample	precision intra-package	precision inter-packag
A	950	5.5	91.9	41.98	6573	4.298	36.81 +	.14	.17	.25
B	1050	11.4	99.0	332.55	0	4.256	36.46 +	.14	.17	.25
C	1100	11.9	99.5	298.84	0	4.269	36.57 +	.09	.13	.23
D	1130	10.4	99.5	322.29	0	4.267	36.55 +	.13	.16	.25
E	1170	11.1	99.8	353.84	0	4.281	36.67 +	.13	.16	.24
F	1200	9.4	100.0	314.48	0	4.289	36.74 +	.11	.14	.23
G	1300	26.5	100.0	308.59	0	4.290	36.75 +	.04	.10	.21
H	1650	13.7	97.7	285.89	0	4.297	36.80 +	.03	.10	.21

Total gas K/Ca = 299.5

Precisions are 1 sigma, measured in Ma. Measured 40/36 atm = 297.2 +.5
J = 0.004797 + 0.25% (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

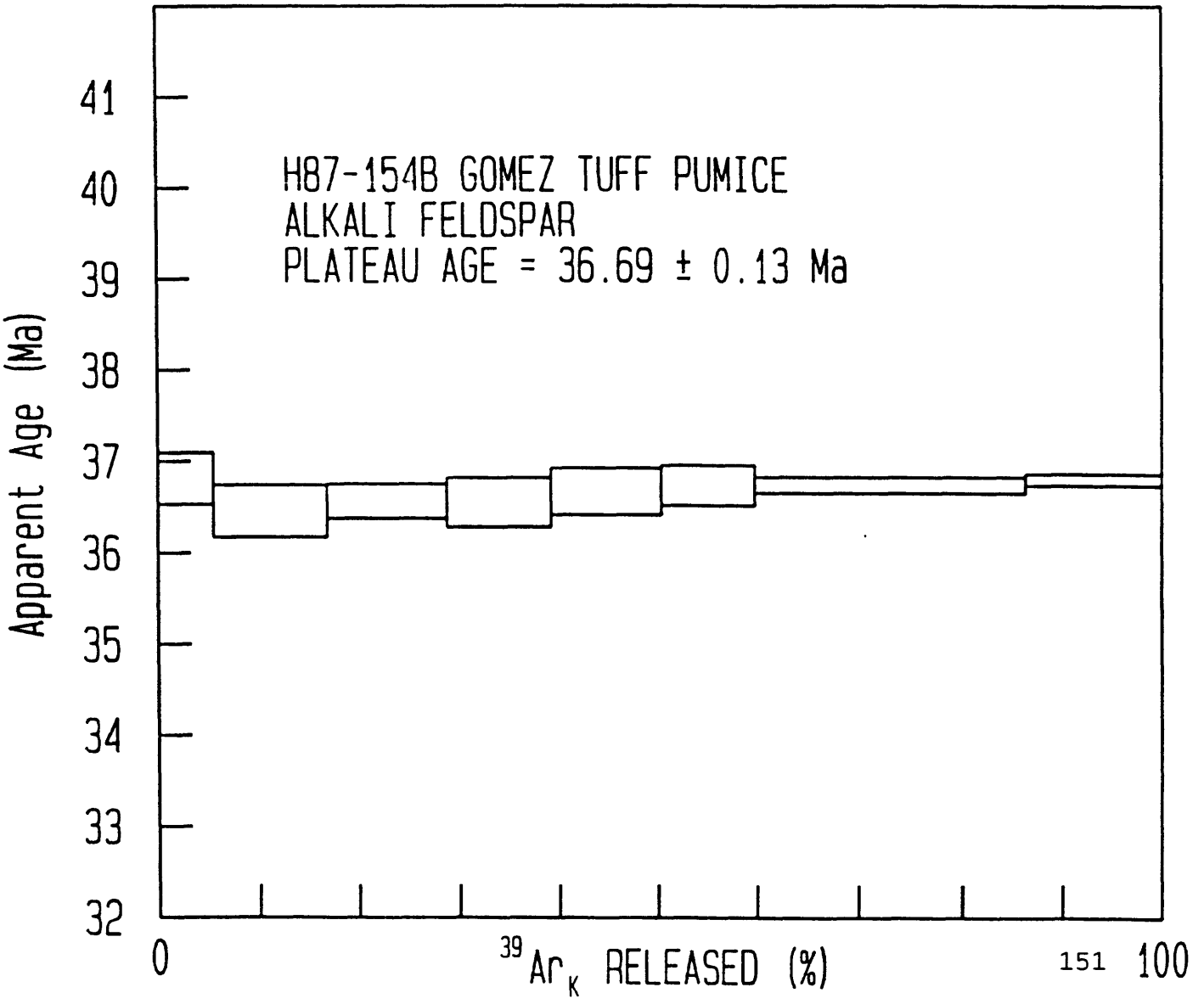
J = 0.004797 + 0.25% SAMPLE WT = 0.5010 g

TEMP C	Initial & radiogenic 40Ar	Potassium derived 39Ar	Chlorine derived 38Ar	Calcium derived 37Ar	Initial 36Ar	AGE* in Ma	**
950	9.030E-12	1.931E-12	***	2.391E-14	2.478E-15	36.81 +	.14
1050	1.726E-11	4.014E-12	***	6.277E-15	***	36.46 +	.14
1100	1.808E-11	4.214E-12	***	7.333E-15	***	36.57 +	.09
1130	1.582E-11	3.686E-12	***	5.947E-15	***	36.55 +	.13
1170	1.688E-11	3.934E-12	***	5.781E-15	***	36.67 +	.13
1200	1.430E-11	3.332E-12	***	5.510E-15	***	36.74 +	.11
1300	4.020E-11	9.366E-12	***	1.578E-14	***	36.75 +	.04
1650	2.127E-11	4.838E-12	***	8.801E-15	1.623E-15	36.80 +	.03
TOTAL GAS	1.528E-10	3.532E-11	***	7.935E-14	5.488E-15	36.68	-

86.3% of gas on plateau, steps 950 through 1300 PLATEAU AGE = 36.69 + .1
83.2% of gas on plateau, steps 1100 through 1650 PLATEAU AGE = 36.75 + .1

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 02/05/91 11:50:25 7 Feb 1992 H87-154B 2D 73



v 02/05/91 (40/36in = 295.5)

v 02/05/91 H89-73 12:59:01 7 Feb 1992

R A W D A T A

FILE	TEMP	40Ar	39Ar	38Ar	37Ar	36Ar regression	TRAP CURRENT	MANIFOLD OPTION
24616	970	94743	9478	350	1	181	200	EALL
	+	39	20	17	11	4		
24617	1100	790784	182449	2397	156	29	200	EALL
	+	600	148	12	10	8		
24618	1170	898745	209029	2776	174	25	200	EALL
	+	647	66	6	8	2		
24619	1240	1217010	282830	3737	256	17	200	EALL
	+	404	170	5	15	6		
24620	1300	1343686	312600	4093	270	26	200	EALL
	+	602	294	20	8	4		
24621	1350	1302509	302693	3984	266	29	200	EALL
	+	397	244	13	4	5		
24622	1400	1202519	278647	3639	248	21	200	EALL
	+	787	226	4	6	12		
24623	1750	614103	137969	1816	220	73	200	EALL
	+	375	97	7	12	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
970	2	1	54	127	0	0	0	0	0	34
1100	38	124	1038	2449	0	0	0	0	-0	6
1170	43	139	1189	2806	0	0	0	0	-0	5
1240	59	204	1609	3796	0	0	0	0	-0	3
1300	65	216	1778	4196	0	0	0	0	-0	5
1350	63	212	1722	4063	0	0	0	0	-0	5
1400	58	198	1585	3740	0	0	0	0	-0	4
1750	29	176	785	1852	0	0	0	0	-0	14

All values in counts, corrected for mass discrimination

v 02/05/91 H89-73 12:59:02 7 Feb 1992

	TEMP C	% TOT 39Ar	RAD YIELD	APP K/Ca	APP K/Cl	F	AGE (Ma)	precision intra-sample	precision intra-package	precision inter-packag
A	970	.6	43.1	1901.18	89	4.299	36.98 +	.96	.97	.99
B	1100	10.6	98.9	337.66	0	4.274	36.77 +	.12	.15	.24
C	1170	12.2	99.2	346.01	0	4.252	36.58 +	.04	.10	.21
D	1240	16.5	99.6	319.26	0	4.273	36.76 +	.06	.11	.21
E	1300	18.2	99.4	333.74	0	4.261	36.66 +	.04	.10	.21
F	1350	17.6	99.3	328.47	0	4.262	36.67 +	.05	.10	.21
G	1400	16.2	99.5	323.77	0	4.280	36.83 +	.11	.15	.24
H	1750	8.0	96.5	180.60	0	4.282	36.84 +	.11	.14	.23

Total gas K/Ca = 327.1

Precisions are 1 sigma, measured in Ma. Measured 40/36 atm = 297.2 +.5
J = 0.004818 + 0.25% (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

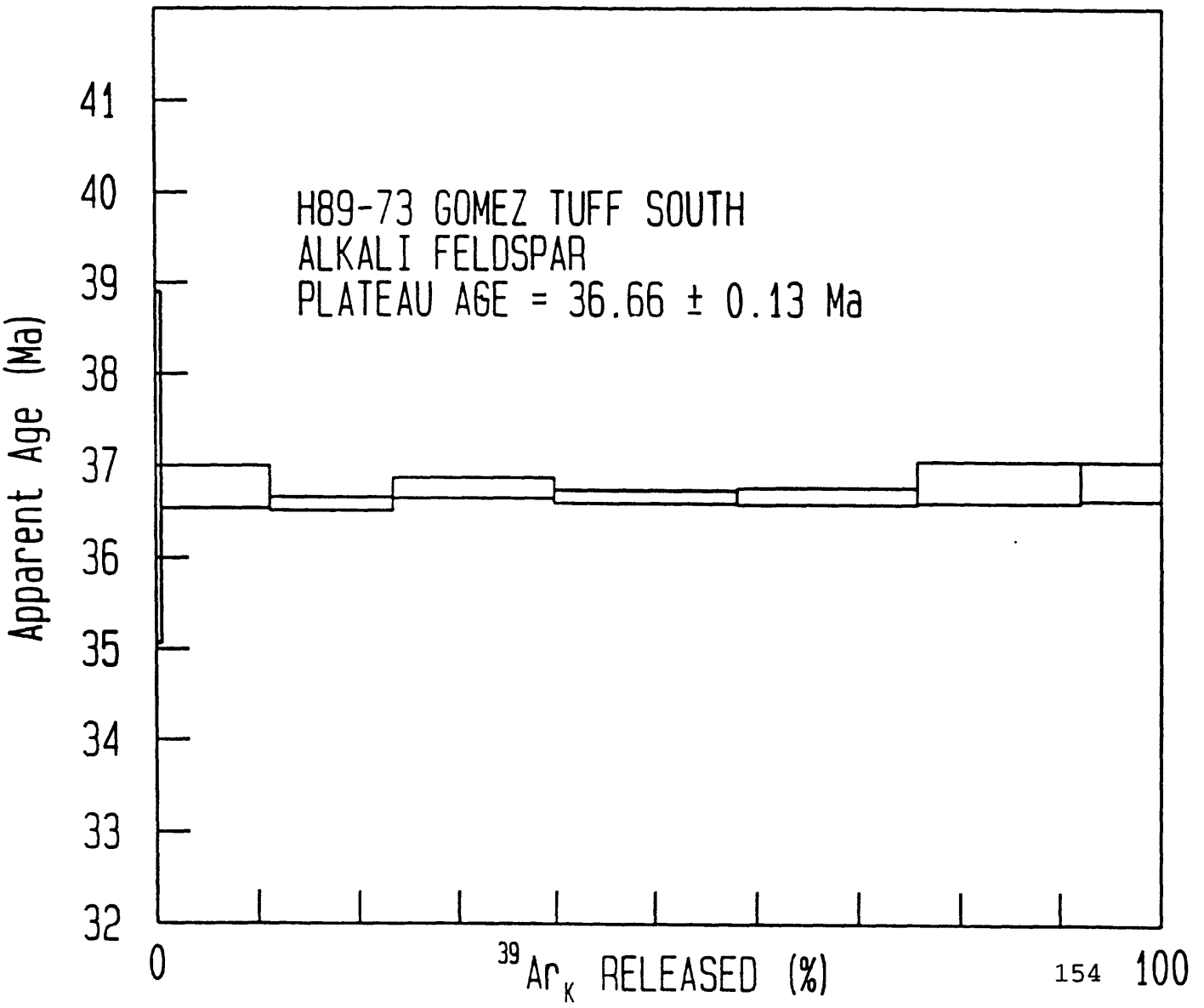
J = 0.004818 + 0.25% SAMPLE WT = 0.5010 g

TEMP C	Initial & radiogenic 40Ar	Potassium derived 39Ar	Chlorine derived 38Ar	Calcium derived 37Ar	Initial 36Ar	AGE* in Ma	**
970	1.894E-12	1.899E-13	5.151E-15	***	3.646E-15	36.98 +	.96
1100	1.579E-11	3.655E-12	***	5.629E-15	***	36.77 +	.12
1170	1.795E-11	4.187E-12	***	6.293E-15	***	36.58 +	.04
1240	2.431E-11	5.666E-12	***	9.229E-15	***	36.76 +	.06
1300	2.684E-11	6.262E-12	***	9.757E-15	***	36.66 +	.04
1350	2.602E-11	6.064E-12	***	9.600E-15	***	36.67 +	.05
1400	2.402E-11	5.582E-12	***	8.965E-15	***	36.83 +	.11
1750	1.227E-11	2.764E-12	***	7.958E-15	1.459E-15	36.84 +	.11
TOTAL GAS	1.491E-10	3.437E-11	5.151E-15	5.748E-14	8.038E-15	36.72	

92.0% of gas on plateau, steps 970 through 1400 PLATEAU AGE = 36.66 + .1
76.6% of gas on plateau, steps 1240 through 1750 PLATEAU AGE = 36.70 + .1

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 02/05/91 13:01:54 7 Feb 1992 H89-73 RD 73



v 02/05/91 (40/36in = 295.5)

R A W D A T A

FILE	TEMP	40Ar	39Ar	38Ar	37Ar	36Ar	TRAP CURRENT	MANIFOLD OPTION
					ä	*		
32522	900	80356	12630	597	218	72	200	EALL
	•	12	9	8	7	9		
32523	950	426757	84806	3768	1644	116	200	EALL
	•	369	73	11	11	5		
32524	1000	1019666	211342	9848	5089	154	200	EALL
	•	157	64	10	12	5		
32525	1050	349116	71539	3468	2105	57	200	EALL
	•	109	41	7	14	6		
32526	1075	141576	28984	1397	927	27	200	EALL
	•	50	23	5	16	5		
32527	1100	115508	23526	984	781	26	200	EALL
	•	14	11	16	5	7		
32528	1125	63524	12793	540	422	18	200	EALL
	•	18	15	13	11	6		

* 36Ar peak values less than 20 are means those above 20 are from linear regressions

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	15	4761	72	170	0	3	0	1	0	13
950	98	36004	483	1139	0	25	1	10	1	20
1000	245	111508	1203	2838	0	79	4	31	2	23
1050	83	46132	407	961	0	33	2	13	1	8
1075	34	20325	165	389	0	14	1	6	0	4
1100	27	17147	134	316	0	12	1	5	0	4
1125	15	9260	73	172	0	7	0	3	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	900	2.8	73.8	1.32	69	4.682	37.23	▪	1.62	1.62	1.63
B	950	19.0	92.6	1.17	77	4.646	36.94	▪	.15	.18	.26
C	1000	47.4	96.5	.94	73	4.638	36.88	▪	.05	.11	.21
D	1050	16.1	96.3	.77	69	4.684	37.24	▪	.21	.23	.30
E	1075	6.5	95.6	.71	69	4.652	36.99	▪	.40	.41	.45
F	1100	5.3	94.5	.68	85	4.626	36.78	▪	.67	.67	.70
G	1125	2.9	92.7	.69	83	4.587	36.47	▪	1.08	1.09	1.10

Total gas K/Ca = .9

Precisions are 1 sigma, measured in Ma. Measured 40/36 atm = 297.2 ▪.5
J = 0.004453 ▪ 0.25% (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: 2.07 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

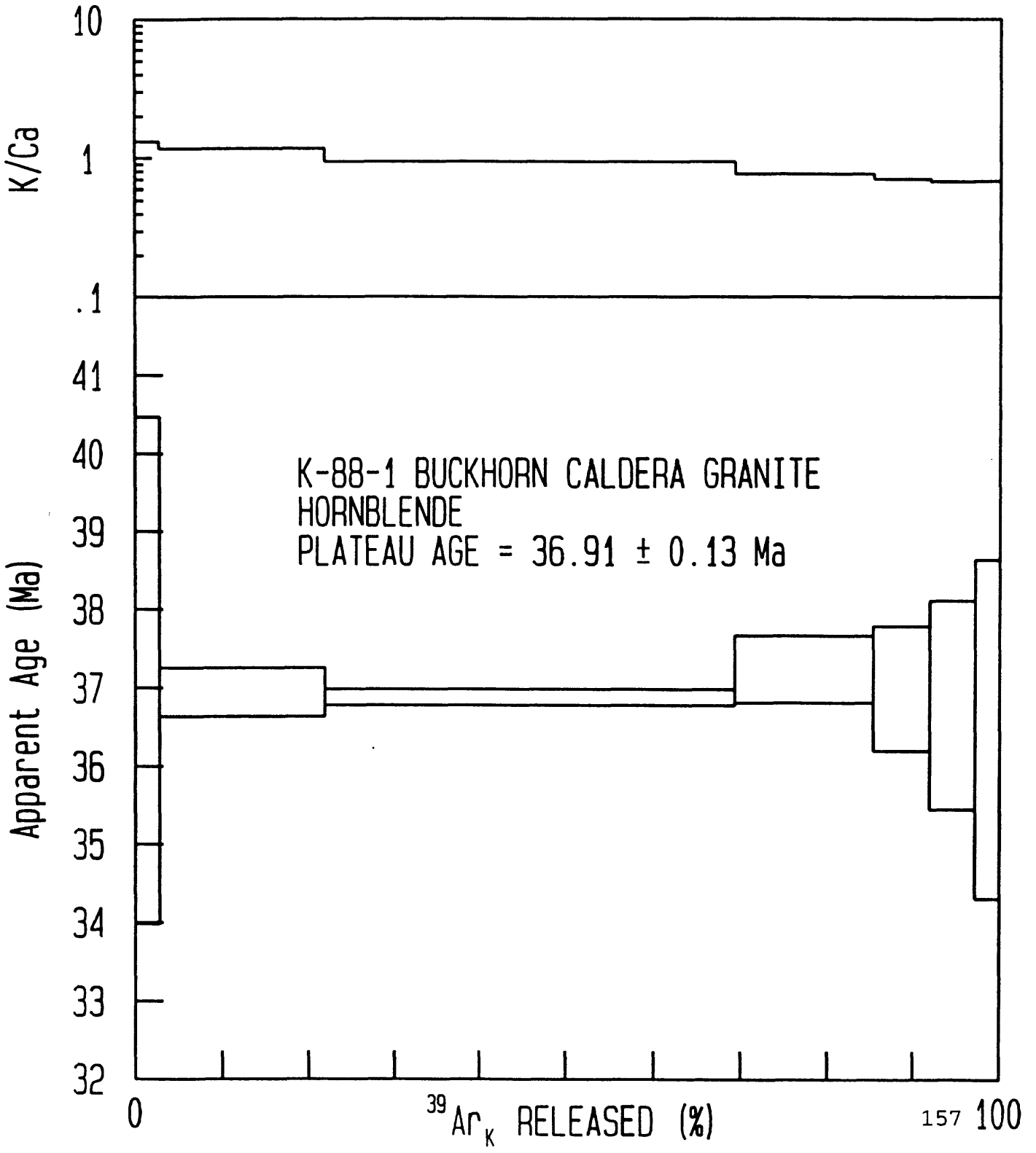
J = 0.004453 ▪ 0.25% SAMPLE WT = 1.0004 g

TEMP C	Initial & radiogenic 40Ar	Potassium derived 39Ar	Chlorine derived 38Ar	Calcium derived 37Ar	Initial 36Ar	AGE* in Ma		**
900	2.451E-12	3.865E-13	1.350E-14	1.527E-13	2.171E-15	37.23	▪	1.62
950	1.302E-11	2.595E-12	8.119E-14	1.154E-12	3.238E-15	36.94	▪	.15
1000	3.110E-11	6.467E-12	2.155E-13	3.575E-12	3.720E-15	36.88	▪	.05
1050	1.065E-11	2.189E-12	7.708E-14	1.479E-12	1.335E-15	37.24	▪	.21
1075	4.318E-12	8.868E-13	3.100E-14	6.517E-13	***	36.99	▪	.40
1100	3.523E-12	7.198E-13	2.061E-14	5.497E-13	***	36.78	▪	.67
1125	1.937E-12	3.914E-13	1.136E-14	2.969E-13	***	36.47	▪	1.08
TOTAL GAS	6.699E-11	1.364E-11	4.502E-13	7.860E-12	1.225E-14	36.95		

100.0% of gas on plateau, steps 900 through 1125 PLATEAU AGE = 36.91 + .13

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

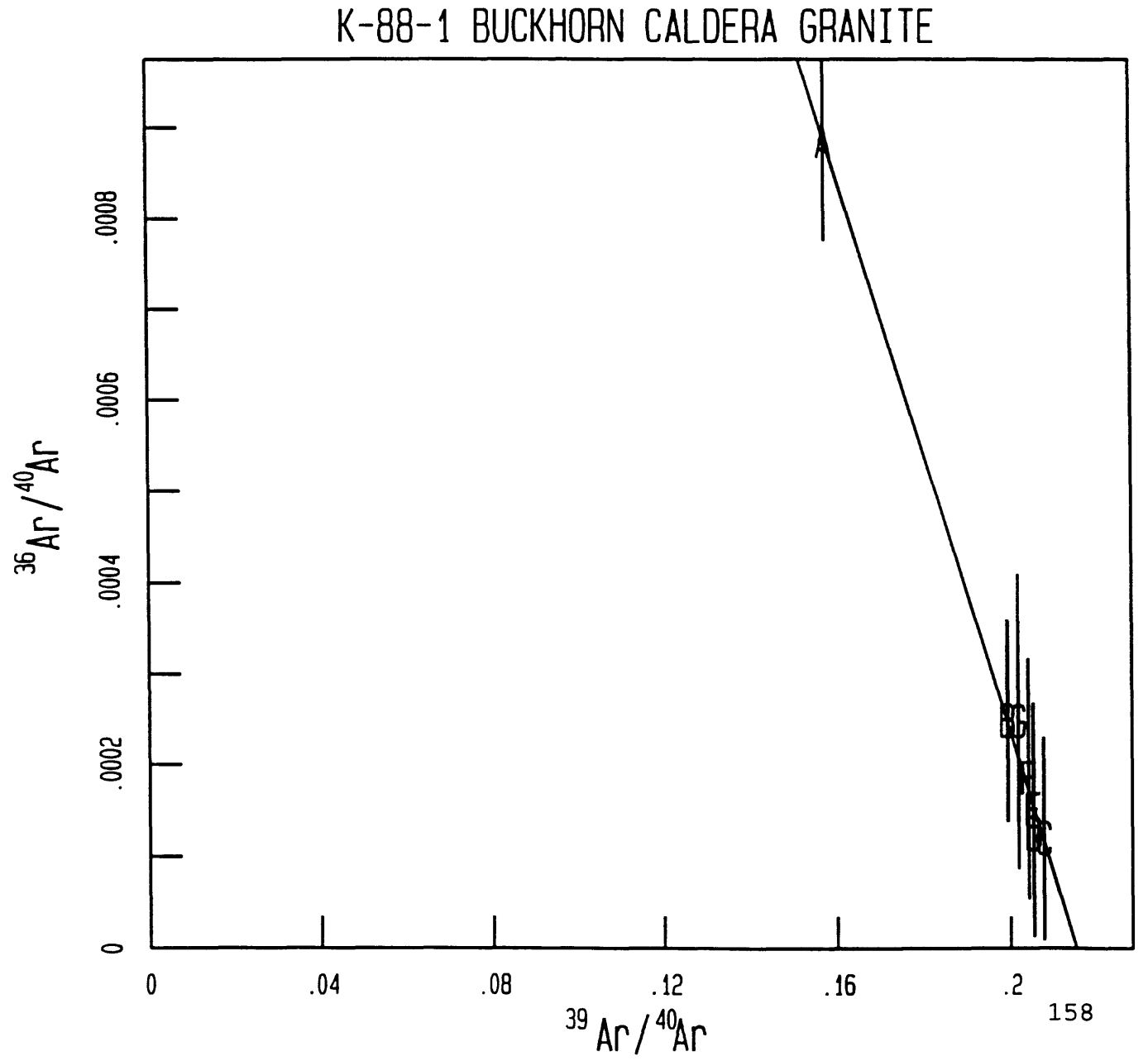
v 06/13/92 19:08:41 17 Apr 1993 K-88-1 HORNBLENDE #2,3&4 RD86



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

v 06/13/92 19:10:16 17 Apr 1993 K-88-1 HORNBLENDE #2,3&4 RD86

7 points regressed out of 7
Mean X = .196E+00 Mean Y = .293E-03 Slope = -.153E-01 ä+Ç .255E-02
36/40 = .330E-02 ä+Ç .504E-03 39/40 = .216E+00 ä+Ç .433E-02
Fit parameters: SUMS = .137 MSWD = .027
40Ar/36Ar = 302.61 ä+Ç 46.12 F = 4.639 ä+Ç .093 AGE = 36.89 ä+Ç .74 Ma



R A W D A T A

FILE	TEMP	40Ar	39Ar	38Ar	37Ar	36Ar regression	TRAP CURRENT	MANIFOLD OPTION
24584	1050	519571	119457	1561	281	33	200	EALL
	+	146	75	14	11	7		
24585	1150	936746	217066	2869	514	11	200	EALL
	+	849	192	6	10	5		
24586	1220	1007568	233630	3072	640	20	200	EALL
	+	402	95	14	5	5		
24587	1270	1044326	241822	3195	702	15	200	EALL
	+	507	159	13	10	4		
24588	1320	2031020	470936	6230	1271	18	200	EALL
	+	1290	323	14	9	6		
24589	1400	2491367	575328	7553	1514	42	200	EALL
	+	1306	234	18	13	10		
24590	1650	231896	49666	600	160	62	200	EALL
	+	33	21	6	17	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
1050	24	213	680	1603	0	0	0	0	-0	6
1150	43	389	1235	2913	0	1	0	0	-0	2
1220	47	485	1329	3136	0	1	0	0	-0	4
1270	48	533	1376	3246	0	1	0	0	-0	3
1320	94	965	2679	6321	0	2	0	1	-0	3
1400	115	1150	3273	7722	0	2	0	1	-0	8
1650	10	122	283	667	0	0	0	0	-0	12

All values in counts, corrected for mass discrimination

v 02/05/91 H87-166 15:50:52 7 Feb 1992

TEMP C	% TOT 39Ar	RAD YIELD	APP K/Ca	APP K/Cl	F	AGE (Ma)	precision intra-sample	precision intra-package	precision inter-packag
A 1050	6.3	98.1	125.56	0	4.254	36.62 +	.16	.18	.26
B 1150	11.4	99.7	124.72	0	4.288	36.91 +	.06	.11	.22
C 1220	12.2	99.4	107.72	0	4.275	36.79 +	.05	.11	.21
D 1270	12.7	99.6	101.52	0	4.288	36.90 +	.05	.10	.21
E 1320	24.7	99.7	109.23	0	4.289	36.92 +	.04	.10	.21
F 1400	30.2	99.5	112.02	0	4.296	36.97 +	.05	.10	.21
G 1650	2.6	92.1	91.48	0	4.286	36.89 +	.29	.30	.35
Total gas K/Ca =			111.2						

Precisions are 1 sigma, measured in Ma. Measured 40/36 atm = 297.2 +.5
J = 0.004820 + 0.25% (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

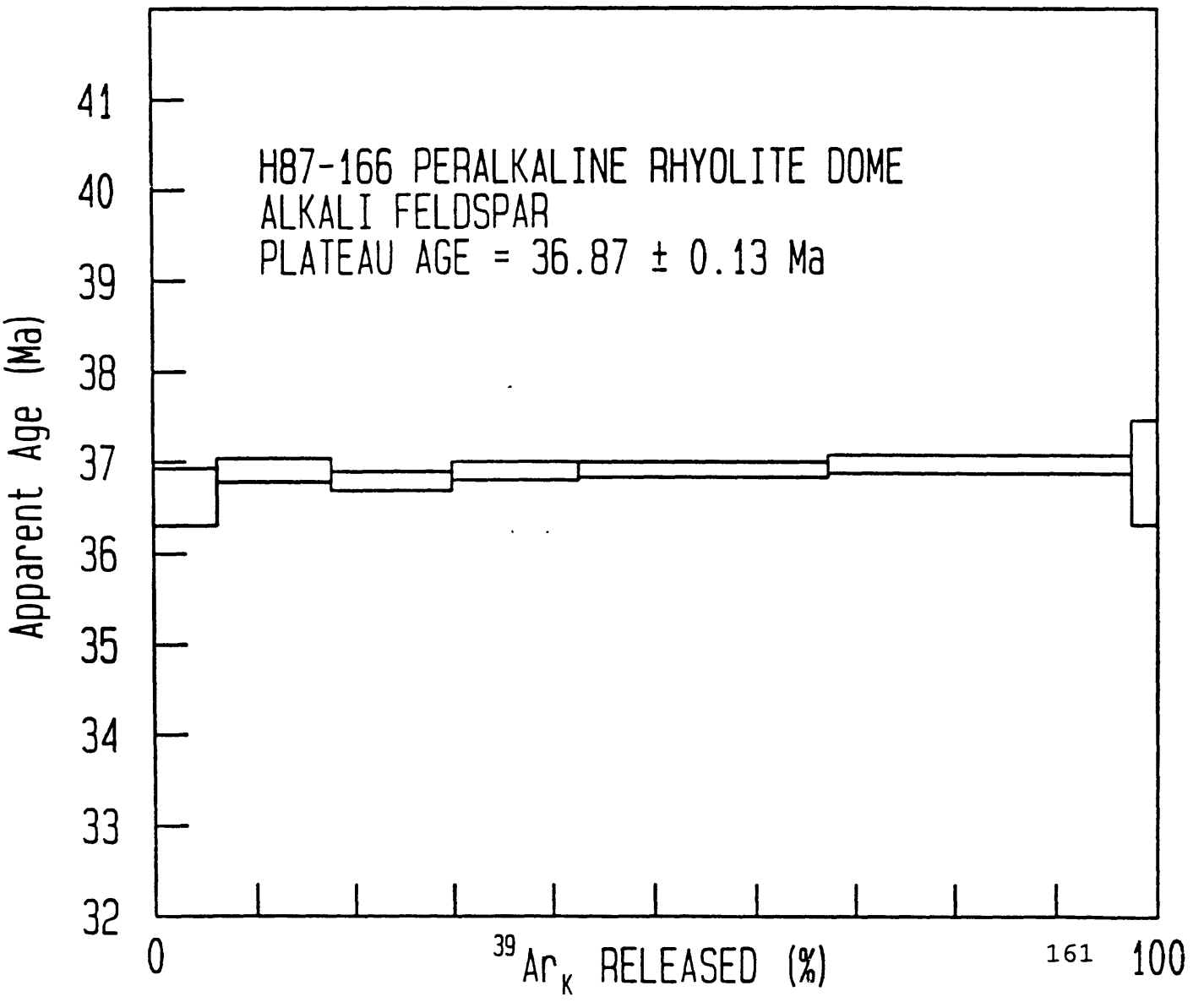
J = 0.004820 + 0.25% SAMPLE WT = 0.5010 g

TEMP C	Initial & radiogenic 40Ar	Potassium derived 39Ar	Chlorine derived 38Ar	Calcium derived 37Ar	Initial 36Ar	AGE* in Ma	**
1050	1.038E-11	2.393E-12	***	9.911E-15	***	36.62 +	.16
1150	1.871E-11	4.348E-12	***	1.813E-14	***	36.91 +	.06
1220	2.012E-11	4.680E-12	***	2.259E-14	***	36.79 +	.05
1270	2.086E-11	4.844E-12	***	2.481E-14	***	36.90 +	.05
1320	4.057E-11	9.434E-12	***	4.491E-14	***	36.92 +	.04
1400	4.976E-11	1.153E-11	***	5.350E-14	8.377E-16	36.97 +	.05
1650	4.632E-12	9.949E-13	***	5.655E-15	1.245E-15	36.89 +	.29
TOTAL GAS	1.650E-10	3.822E-11	***	1.795E-13	4.003E-15	36.90	

67.2% of gas on plateau, steps 1050 through 1320 PLATEAU AGE = 36.87 + .1
93.7% of gas on plateau, steps 1150 through 1650 PLATEAU AGE = 36.90 + .1

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 02/05/91 15:52:53 7 Feb 1992 H87-166 RD73



v 02/05/91 (40/36in = 295.5)

5-27-71 STAR MOUNTAIN; 53,54:RD56

R A W D A T A

FILE	TEMP	40Ar	39Ar	38Ar	37Ar	36Ar mean	TRAP CURRENT	MANIFOLD OPTION
17735:	900	3439240	820444	10500	5336	75	200	ALL
	±	2180	352	31	25	8		
17736:	1075	2259111	539222	6939	4133	55	200	ALL
	±	1184	275	35	9	8		
17737:	1075	737016	175652	2237	1377	18	200	ALL
	±	298	58	67	9	6		
17738:	1120	1488637	353261	4532	3000	67	200	ALL
	±	501	65	45	18	23		
17739:	1150	1108195	261745	3340	2047	51	200	ALL
	±	332	80	33	11	15		
17740:	1180	961237	225482	2904	1637	53	200	ALL
	±	474	174	87	7	5		
17741:	1220	598779	139159	1775	960	50	200	ALL
	±	200	61	53	13	8		
17742:	1300	128549	29237	377	210	15	200	ALL
	±	53	29	38	8	7		

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	K-derived 38Ar	K-derived 37Ar	Ca-derived 39Ar	Ca-derived 38Ar	Ca-derived 36Ar	Cl-der 36Ar	Initial 38Ar
900	260	7675	4665	11007	0	9	0	3	-0	13
1075	171	5948	3066	7234	0	7	0	3	-0	10
1075	56	1984	999	2356	0	2	0	1	-0	3
1120	112	4325	2009	4739	0	5	0	2	-0	12
1150	83	2953	1488	3511	0	3	0	1	-0	9
1180	72	2364	1282	3025	0	3	0	1	-0	10
1220	44	1387	791	1867	0	2	0	1	-0	9
1300	9	303	166	392	0	0	0	0	-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	900	32.2	99.4	32.74	0	4.156	36.86	±	.04	.10	.21
B	1075	21.2	99.3	27.78	0	4.150	36.81	±	.05	.10	.21
C	1075	6.9	99.3	27.14	0	4.157	36.87	±	.10	.13	.23
D	1120	13.9	98.7	25.04	0	4.149	36.80	±	.17	.19	.27
E	1150	10.3	98.7	27.18	0	4.168	36.96	±	.15	.18	.26
F	1180	8.9	98.4	29.26	0	4.184	37.10	±	.07	.12	.22
G	1220	5.5	97.6	30.78	0	4.187	37.14	±	.15	.18	.26
H	1300	1.1	96.7	29.60	0	4.241	37.60	±	.59	.60	.63
Total gas K/Ca =				29.2							

Precisions are 1 sigma, measured in Ma. Measured 40/36 atm = 296.5 ±.5
J = 0.004967 ± 0.25% (intra-package) ± 0.50% (inter-package)
Trap current factors- 40: 1 100: .43 200: 1
Manifold factors- ALL: 1 SPLIT 1: 3.6 SPLIT 2: 12.96 SPLIT 3: 46.656
Sensitivity = 1.650E-17 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

5-27-71 STAR MOUNTAIN; 53,54:RD56

J = 0.004967 ± 0.25% SAMPLE WT = 0.5611 g

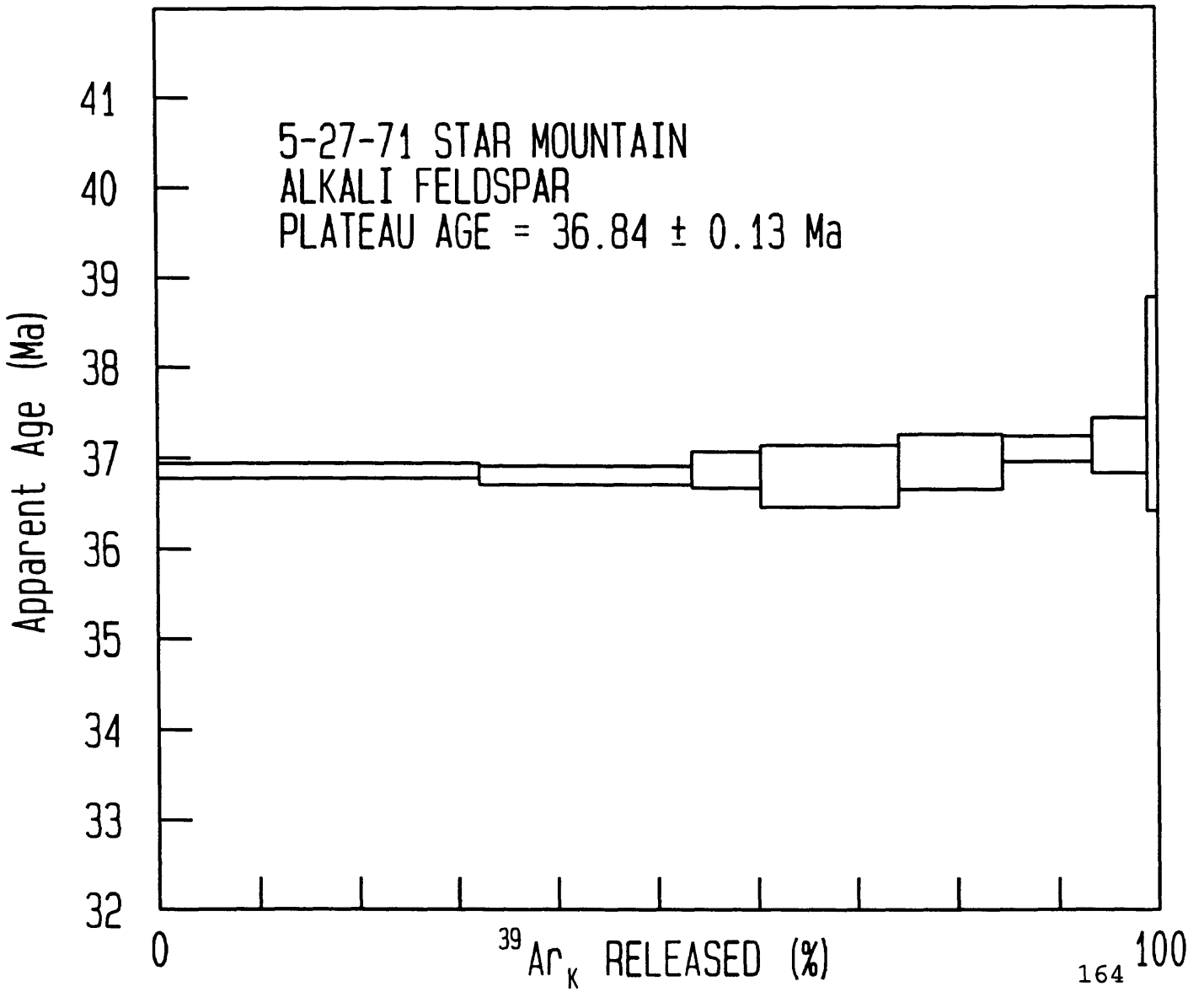
TEMP C	Initial & radiogenic 40Ar	Potassium derived 39Ar	Chlorine derived 38Ar	Calcium derived 37Ar	Initial 36Ar	AGE* in Ma	**
900	5.667E-11	1.355E-11	***	2.152E-13	1.182E-15	36.86 ±	.10
1075	3.722E-11	8.907E-12	***	1.668E-13	8.653E-16	36.81 ±	.10
1075	1.214E-11	2.902E-12	***	5.560E-14	***	36.87 ±	.13
1120	2.453E-11	5.836E-12	***	1.212E-13	1.076E-15	36.80 ±	.19
1150	1.826E-11	4.324E-12	***	8.271E-14	8.161E-16	36.96 ±	.18
1180	1.584E-11	3.725E-12	***	6.619E-14	8.668E-16	37.10 ±	.12
1220	9.867E-12	2.299E-12	***	3.883E-14	8.160E-16	37.14 ±	.18
1300	2.118E-12	4.830E-13	***	8.484E-15	***	37.60 ±	.60
TOTAL GAS	1.767E-10	4.203E-11	***	7.550E-13	6.142E-15	36.90	

K/Ca = 29.2

84.5% of gas on plateau, steps 900 through 1150 PLATEAU AGE = 36.84 ± .13

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 2/18/89


5-27-71 STAR MOUNTAIN
ALKALI FELDSPAR
PLATEAU AGE = 36.84 ± 0.13 Ma
Apparent Age (Ma)
41
40
39
38
37
36
35
34
33
32
0
$^{39}Ar_K$ RELEASED (%)
100

5-27-71

R A W D A T A

FILE	TEMP	40Ar	39Ar	38Ar	37Ar	36Ar mean	TRAP CURRENT	MANIFOLD OPTION
19651:	750	572243	126625	1721	605	149	200	ALL
	±	135	37	52	14	9		
19652:	950	1211573	287865	3704	1245	40	100	ALL
	±	384	95	37	5	11		
19653:	1075	3575464	832771	10773	3901	355	200	ALL
	±	899	163	32	26	5		
19654:	1120	1325538	306474	3971	1613	168	200	ALL
	±	397	68	40	11	19		
19655:	1180	3675128	865415	11170	4970	254	200	ALL
	±	1217	788	34	8	6		
19656:	1450	3432898	803443	10340	3934	242	200	ALL
	±	1777	367	31	6	6		

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	K-derived 38Ar	K-derived 37Ar	Ca-derived 39Ar	Ca-derived 38Ar	Ca-derived 36Ar	Cl-der 36Ar	Initial 38Ar
750	60	1634	720	1699	0	2	0	1	0	28
950	137	3364	1637	3862	0	3	0	1	-0	7
1075	398	10546	4736	11174	0	10	0	4	-0	66
1120	146	4363	1743	4112	0	4	0	2	-0	31
1180	414	13454	4922	11612	0	12	1	5	-0	47
1450	384	10655	4570	10780	0	10	0	4	-0	45

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	3.1	92.3	29.38	5862	4.161	36.80	±	.18	.21	.28
B 950	28.2	99.1	32.44	0	4.158	36.77	±	.10	.14	.23
C 1075	20.4	97.1	29.94	0	4.157	36.77	±	.02	.09	.21
D 1120	7.5	96.3	26.64	0	4.153	36.73	±	.16	.19	.26
E 1180	21.2	98.0	24.40	0	4.150	36.71	±	.04	.10	.21
F 1450	19.7	97.9	28.60	0	4.174	36.91	±	.03	.10	.21
Total gas K/Ca =			28.9							

Precisions are 1 sigma, measured in Ma. Measured 40/36 atm = 296.5 ±.5
J = 0.004953 ± 0.25% (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 = 6.000E-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±4.0E-03

5-27-71

J = 0.004953 ± 0.25% SAMPLE WT = 0.3301 g

TEMP C	Initial & radiogenic 40Ar	Potassium derived 39Ar	Chlorine derived 38Ar	Calcium derived 37Ar	Initial 36Ar	AGE* in Ma	**
750	3.429E-12	7.607E-13	3.140E-16	1.347E-14	8.928E-16	36.80 ±	.21
950	2.904E-11	6.918E-12	***	1.109E-13	***	36.77 ±	.14
1075	2.142E-11	5.003E-12	***	8.690E-14	2.112E-15	36.77 ±	.09
1120	7.943E-12	1.841E-12	***	3.595E-14	1.000E-15	36.73 ±	.19
1180	2.202E-11	5.199E-12	***	1.108E-13	1.497E-15	36.71 ±	.10
1450	2.057E-11	4.827E-12	***	8.776E-14	1.435E-15	36.91 ±	.10
TOTAL GAS	1.044E-10	2.455E-11	3.140E-16	4.458E-13	7.867E-15	36.78	

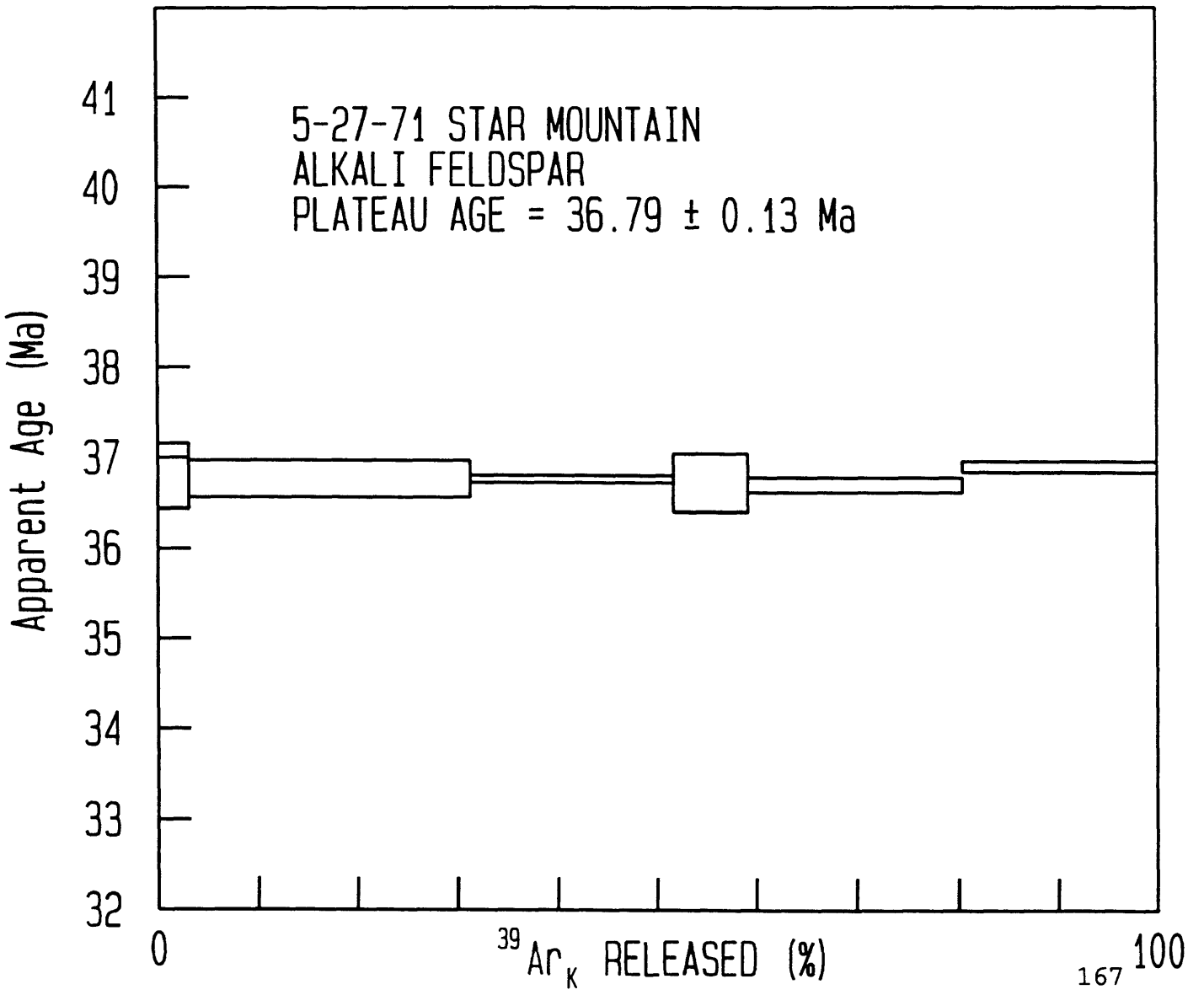
K/Ca = 28.9

100.0% of gas on plateau, steps 750 through 1450 PLATEAU AGE = 36.79 ± .13

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 2/18/89

v 08/23/93 16:14:10 7 Dec 1993



v 08/23/93 (40/36in = 295.5)

R A W D A T A

FILE	TEMP	40Ar	39Ar	38Ar	37Ar	36Ar *	TRAP CURRENT	MANIFOLD OPTION
19572:	750	338603	72546	982	501	78	200	ALL
	±	112	18	20	8	24		
19573:	900	984524	228840	2986	1544	49	200	ALL
	±	840	175	6	15	8		
19574:	1075	2730582	639734	8262	4344	52	200	ALL
	±	1931	215	17	26	7		
19575:	1120	1613044	378950	4902	2575	43	200	ALL
	±	380	126	7	19	8		
19576:	1150	1495919	351780	4552	2366	32	200	ALL
	±	559	235	19	12	19		
19577:	1180	1734398	408370	5269	2731	44	200	ALL
	±	689	140	16	18	8		
19578:	1300	2173959	509086	6572	3472	31	100	ALL
	±	779	184	22	23	5		
19580:	1450	679847	155218	2002	1018	26	200	ALL
	±	146	26	1	24	8		

38Ar errors assigned from experience, rest calculated from regression statistics
* 36Ar peak values less than 50 are means; those above 50 are from linear regressions

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	32	1185	413	973	0	1	0	0	0	14
900	101	3654	1301	3070	0	4	0	1	-0	9
1075	283	10289	3638	8583	0	10	0	4	-0	9
1120	168	6102	2155	5084	0	6	0	2	-0	8
1150	156	5613	2001	4720	0	5	0	2	-0	6
1180	181	6481	2322	5479	0	6	0	2	-0	8
1300	225	8248	2895	6830	0	8	0	3	-0	5
1450	69	2421	883	2083	0	2	0	1	-0	5

All values in counts, corrected for mass discrimination

H87-155 #7RD60 STAR MOUNTAIN
v 08/23/93 H87-155 #7RD60 STAR MOUNTAIN 18:18:30 16 Dec 1993

	TEMP C	% TOT 39Ar	RAD YIELD	APP K/Ca	APP K/Cl	F	AGE (Ma)	intra-sample	precision intra-package
A	750	1.7	93.2	22.34	6962	4.340	37.88 ±	.83	.84
B	900	5.4	98.6	22.86	0	4.230	36.92 ±	.10	.13
C	1075	15.0	99.5	22.71	0	4.235	36.97 ±	.04	.10
D	1120	8.9	99.3	22.68	0	4.214	36.79 ±	.05	.11
E	1150	8.2	99.4	22.90	0	4.216	36.81 ±	.14	.17
F	1180	9.6	99.3	23.02	0	4.206	36.72 ±	.05	.11
G	1300	47.7	99.6	22.56	0	4.243	37.04 ±	.03	.10
H	1450	3.6	98.9	23.44	0	4.320	37.70 ±	.14	.17
Total gas				22.7					

Precisions are 1 sigma, measured in Ma. Measured 40/36 atm = 296.5 ±.5
J = 0.004889 ± 0.25% (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
EALL: 2 ESPLIT 1: 6.6 ESPLIT 2: 21.78
Sensitivity = 6.000E-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 08/23/93 18:18:33 16 Dec 1993

H87-155 #7RD60 STAR MOUNTAIN

J = 0.004889 ± 0.25% SAMPLE WT = 0.3302 g

TEMP C	Initial & radiogenic 40Ar	Potassium derived 39Ar	Chlorine derived 38Ar	Calcium derived 37Ar	Initial 36Ar	AGE* in Ma	**
750	2.029E-12	4.358E-13	***	1.014E-14	4.653E-16	37.88 ±	.83
900	5.899E-12	1.375E-12	***	3.127E-14	2.862E-16	36.92 ±	.10
1075	1.636E-11	3.843E-12	***	8.802E-14	2.930E-16	36.97 ±	.04
1120	9.665E-12	2.277E-12	***	5.219E-14	2.434E-16	36.79 ±	.05
1150	8.964E-12	2.113E-12	***	4.800E-14	***	36.81 ±	.14
1180	1.039E-11	2.453E-12	***	5.541E-14	2.486E-16	36.72 ±	.05
1300	5.211E-11	1.223E-11	***	2.820E-13	***	37.04 ±	.03
1450	4.074E-12	9.325E-13	***	2.069E-14	***	37.70 ±	.14
TOTAL GAS	1.095E-10	2.566E-11	***	5.877E-13	2.551E-15	36.99	

NO PLATEAU

48.7% of gas released in steps 750 through 1180 average age = 36.86 + .13

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

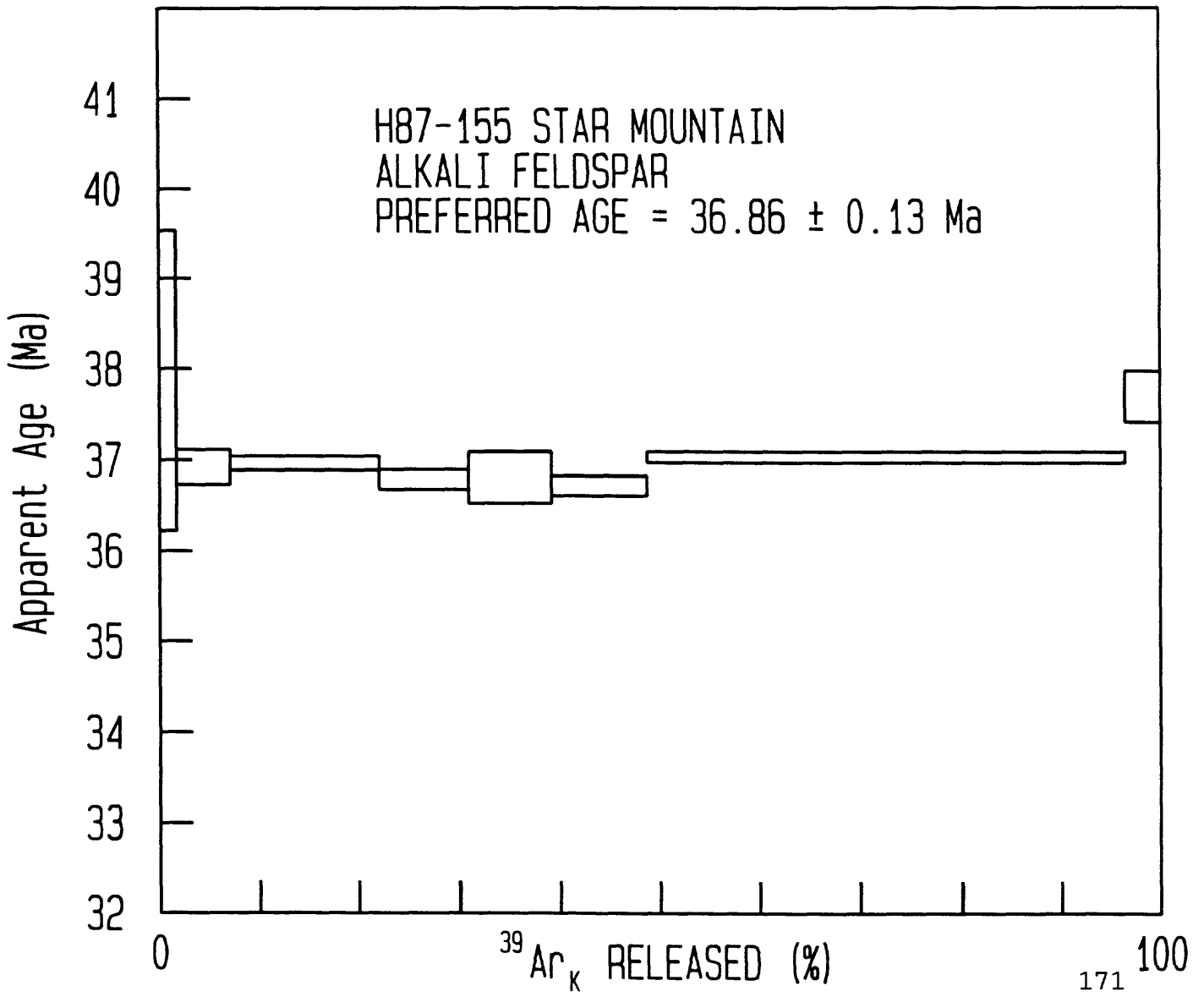
* Ages calculated assuming initial 40Ar/36Ar = 295.5 ± 0

** 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 08/23/93


H87-155 STAR MOUNTAIN
ALKALI FELDSPAR
PREFERRED AGE = 36.86 ± 0.13 Ma
Apparent Age (Ma)
41
40
39
38
37
36
35
34
33
32
0
$^{39}Ar_K$ RELEASED (%)
100

H87-157

R A W D A T A

FILE	TEMP	40Ar	39Ar	38Ar	37Ar	36Ar mean	TRAP CURRENT	MANIFOLD OPTION
19637:	750	715882	168021	2185	1409	46	200	ALL
	±	292	72	66	29	14		
19638:	900	1778027	422104	5410	3519	44	200	ALL
	±	505	102	54	16	15		
19639:	1075	1042007	247797	3210	2554	35	200	ALL
	±	521	118	32	13	7		
19640:	1120	1436212	343152	4464	3850	28	200	ALL
	±	368	86	45	17	11		
19641:	1150	1639099	391159	5075	4371	43	200	ALL
	±	508	146	51	9	18		
19642:	1180	2265278	539783	6972	5942	51	200	ALL
	±	969	194	35	16	11		
19643:	1220	3599042	856366	11009	9063	54	200	ALL
	±	1080	201	33	15	11		
19644:	1450	3755192	890637	11412	9454	83	200	ALL
	±	1869	595	34	16	11		

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	K-derived 38Ar	K-derived 37Ar	Ca-derived 39Ar	Ca-derived 38Ar	Ca-derived 36Ar	Cl-der 36Ar	Initial 38Ar
750	79	3679	956	2254	0	3	0	1	-0	8
900	198	9196	2401	5664	0	9	0	3	-0	8
1075	116	6679	1409	3325	0	6	0	2	-0	6
1120	161	10078	1952	4604	0	9	0	4	-0	5
1150	183	11451	2225	5248	0	11	1	4	-0	7
1180	253	15575	3070	7242	0	15	1	6	-0	8
1220	402	23777	4870	11490	0	22	1	9	-0	8
1450	418	24816	5065	11950	0	23	1	9	-0	14

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	4.4	98.1	17.15	0	4.170	36.84	±	.21	.23	.30
B	900	10.9	99.3	17.24	0	4.172	36.86	±	.09	.13	.23
C	1075	6.4	99.1	13.94	0	4.156	36.71	±	.08	.12	.22
D	1120	8.9	99.5	12.80	0	4.153	36.69	±	.09	.13	.22
E	1150	10.1	99.3	12.84	0	4.150	36.66	±	.12	.15	.24
F	1180	14.0	99.4	13.03	0	4.161	36.76	±	.06	.11	.21
G	1220	22.2	99.6	13.54	0	4.176	36.89	±	.04	.10	.21
H	1450	23.1	99.4	13.50	0	4.181	36.93	±	.04	.10	.21
Total gas K/Ca =				13.9							

Precisions are 1 sigma, measured in Ma. Measured 40/36 atm = 296.5 ±.5
J = 0.004947 ± 0.25% (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 = 6.000E-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±4.0E-03

H87-157

J = 0.004947 ± 0.25% SAMPLE WT = 0.3300 g

TEMP C	Initial & radiogenic 40Ar	Potassium derived 39Ar	Chlorine derived 38Ar	Calcium derived 37Ar	Initial 36Ar	AGE* in Ma	**
750	4.290E-12	1.009E-12	***	3.060E-14	2.707E-16	36.84 ±	.23
900	1.065E-11	2.536E-12	***	7.649E-14	2.473E-16	36.86 ±	.13
1075	6.244E-12	1.489E-12	***	5.553E-14	***	36.71 ±	.12
1120	8.606E-12	2.062E-12	***	8.378E-14	***	36.69 ±	.13
1150	9.821E-12	2.350E-12	***	9.517E-14	***	36.66 ±	.15
1180	1.357E-11	3.243E-12	***	1.294E-13	2.718E-16	36.76 ±	.11
1220	2.157E-11	5.145E-12	***	1.975E-13	2.727E-16	36.89 ±	.10
1450	2.250E-11	5.351E-12	***	2.061E-13	4.456E-16	36.93 ±	.10
TOTAL GAS	9.725E-11	2.318E-11	***	8.747E-13	2.085E-15	36.82	

K/Ca = 13.9

76.9% of gas on plateau, steps 750 through 1220 PLATEAU AGE = 36.81 ± .13

59.3% of gas on plateau, steps 1180 through 1450 PLATEAU AGE = 36.87 ± .13

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

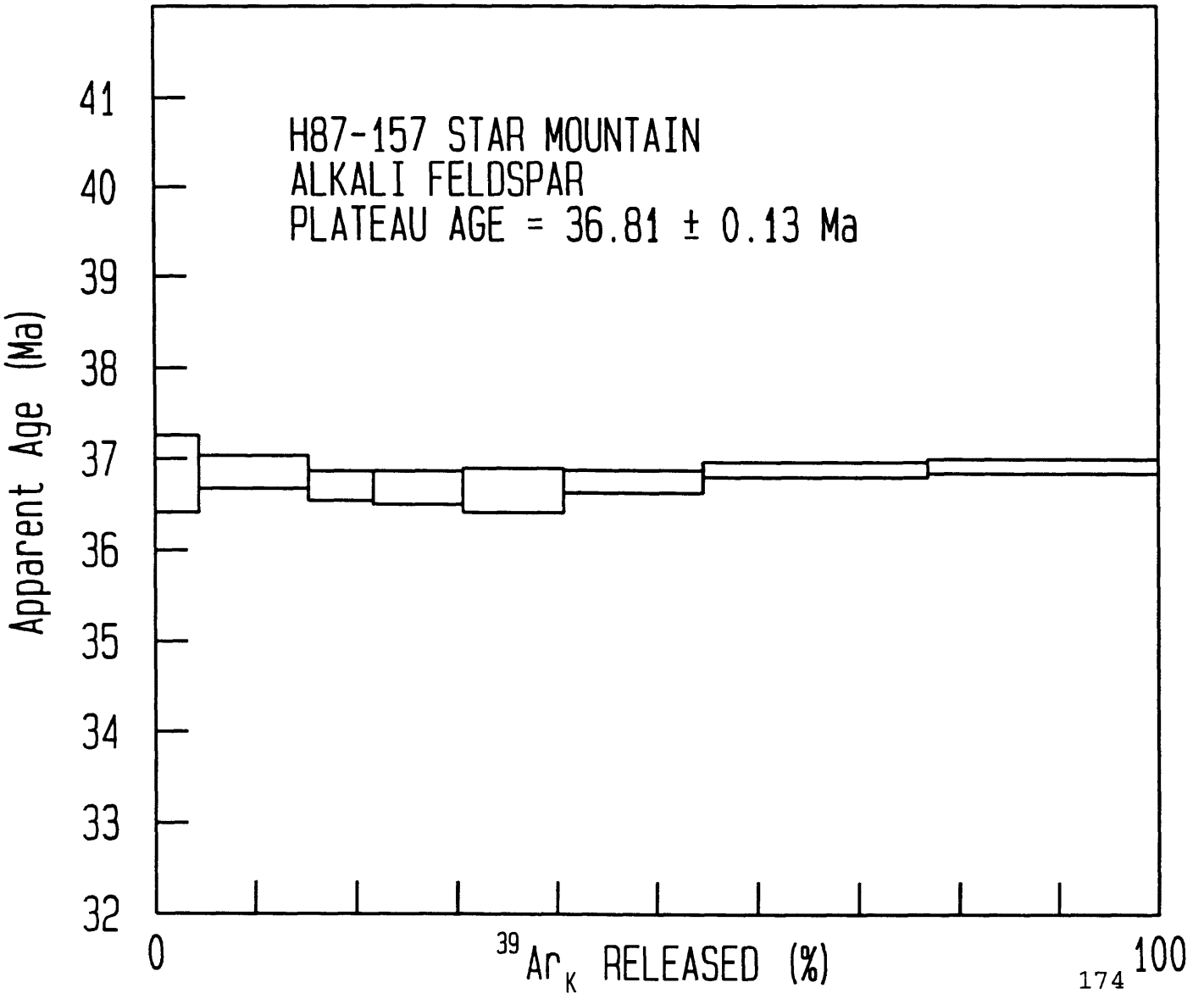
* Ages calculated assuming initial 40Ar/36Ar = 295.5 ± 0

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

*** below detection limit

v 2/18/89

v 08/23/93 16:34:47 7 Dec 1993



v 08/23/93 (40/36in = 295.5)

v 06/13/92 H88-79 #22 RD92 20:54:50 23 Feb 1993

R A W D A T A

FILE	TEMP	40Ar	39Ar	38Ar	37Ar ä	36Ar *	TRAP CURRENT	MANIFOLD OPTION
35224	1000	697794	166901	2180	880	53	200	EALL
	▪	339	88	16	6	11		
35225	1120	555481	134094	1715	527	46	200	EALL
	▪	201	102	13	10	8		
35226	1220	1280577	309525	3950	1337	44	200	EALL
	▪	441	216	7	12	3		
35227	1280	176217	42534	543	158	12	200	EALL
	▪	96	10	5	1	3		

* 36Ar peak values less than 10 are means those above 10 are from linear regressions

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
1000	135	7000	950	2242	0	5	0	2	-0	10
1120	108	4191	763	1801	0	3	0	1	-0	8
1220	250	10641	1762	4157	0	8	0	3	-0	8
1280	34	1262	242	571	0	1	0	0	-0	2

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	1000	25.6	97.8	10.99	0	4.074	36.87 ▪	.17	.19	.27
B	1120	20.5	97.6	14.75	0	4.027	36.45 ▪	.15	.18	.25
C	1220	47.4	99.1	13.41	0	4.083	36.95 ▪	.03	.10	.21
D	1280	6.5	98.0	15.54	0	4.046	36.61 ▪	.18	.21	.28

Total gas K/Ca = 13.2

Precisions are 1 sigma, measured in Ma. Measured 40/36 atm = 297.3 ▪.5
J = 0.005068 ▪ 0.25% (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: 2.07 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

v 06/13/92 20:54:53 23 Feb 1993

H88-79 #22 RD92

J = 0.005068 ▪ 0.25% SAMPLE WT = 0.2496 g

TEMP C	Initial & radiogenic 40Ar	Potassium derived 39Ar	Chlorine derived 38Ar	Calcium derived 37Ar	Initial 36Ar	AGE* in Ma	**
1000	2.128E-11	5.108E-12	***	2.417E-13	1.579E-15	36.87 ▪	.17
1120	1.694E-11	4.104E-12	***	1.447E-13	1.386E-15	36.45 ▪	.15
1220	3.905E-11	9.472E-12	***	3.674E-13	1.250E-15	36.95 ▪	.03
1280	5.373E-12	1.302E-12	***	4.355E-14	***	36.61 ▪	.18
TOTAL GAS	8.263E-11	1.999E-11	***	7.973E-13	4.576E-15	36.80	

53.9% of gas on plateau, steps 1220 through 1280 PLATEAU AGE = 36.94 + .13

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

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

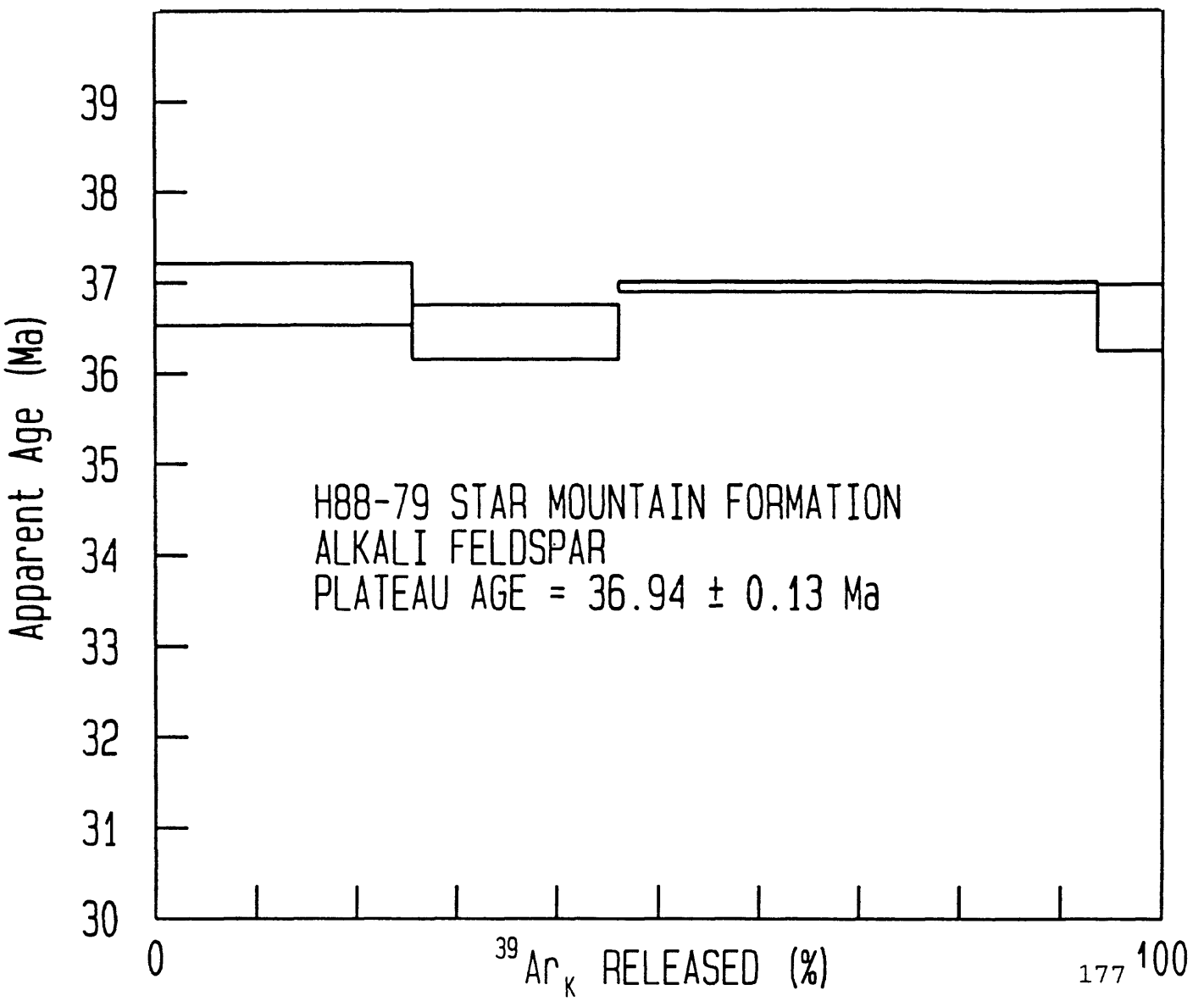
** 1-sigma precision estimates are for intra-sample reproducibility.

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

*** below detection limit

v 06/13/92

v 06/13/92 20:58:38 23 Feb 1993 H88-79 #22 RD92



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

v 02/05/91 H88-79 15:19:31 7 Feb 1992

R A W D A T A

FILE	TEMP	40Ar	39Ar	38Ar	37Ar	36Ar regression	TRAP CURRENT	MANIFOLD OPTION
24522	1000	1465184	330085	4372	10302	149	200	EALL
	+	620	164	9	14	11		
24523	1100	966818	222569	2909	6474	18	200	EALL
	+	384	142	19	10	4		
24524	1200	864371	198830	2639	4800	39	200	EALL
	+	599	119	14	4	7		
24525	1230	681941	156638	2060	3436	24	200	EALL
	+	237	19	13	13	5		
24526	1270	989332	227566	2979	5174	38	200	EALL
	+	982	226	4	10	5		
24527	1300	935320	214257	2814	4930	39	200	EALL
	+	372	75	18	8	5		
24528	1400	2360616	540433	7055	13408	61	200	EALL
	+	1576	496	22	14	5		
24529	1650	476949	107780	1409	2658	31	200	EALL
	+	206	66	10	8	18		

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
1000	54	6143	1878	4430	0	11	1	4	-0	27
1100	36	3864	1266	2987	0	7	0	3	-0	3
1200	33	2868	1131	2669	0	5	0	2	-0	7
1230	26	2054	891	2102	0	4	0	1	-0	4
1270	37	3096	1295	3054	0	6	0	2	-0	7
1300	35	2953	1219	2876	0	5	0	2	-0	7
1400	89	8040	3074	7253	0	14	1	6	-0	10
1650	18	1595	613	1447	0	3	0	1	-0	6

All values in counts, corrected for mass discrimination

v 02/05/91 H88-79 15:19:33 7 Feb 1992

	TEMP C	% TOT 39Ar	RAD YIELD	APP K/Ca	APP K/Cl	F	AGE (Ma)	precision intra-sample	precision intra-package	precision inter-packag
A	1000	16.5	97.1	10.41	0	4.296	36.86 +	.08	.13	.22
B	1100	11.1	99.5	11.16	0	4.312	36.99 +	.05	.10	.21
C	1200	10.0	98.7	13.45	0	4.279	36.71 +	.09	.13	.23
D	1230	7.8	99.0	14.80	0	4.298	36.87 +	.08	.12	.22
E	1270	11.4	98.9	14.27	0	4.289	36.80 +	.07	.11	.22
F	1300	10.7	98.8	14.10	0	4.301	36.90 +	.06	.11	.22
G	1400	27.0	99.3	13.07	0	4.325	37.10 +	.04	.10	.21
H	1650	5.4	98.1	13.14	0	4.330	37.15 +	.41	.42	.46

Total gas K/Ca = 12.8

Precisions are 1 sigma, measured in Ma. Measured 40/36 atm = 297.2 +.5
J = 0.004805 + 0.25% (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

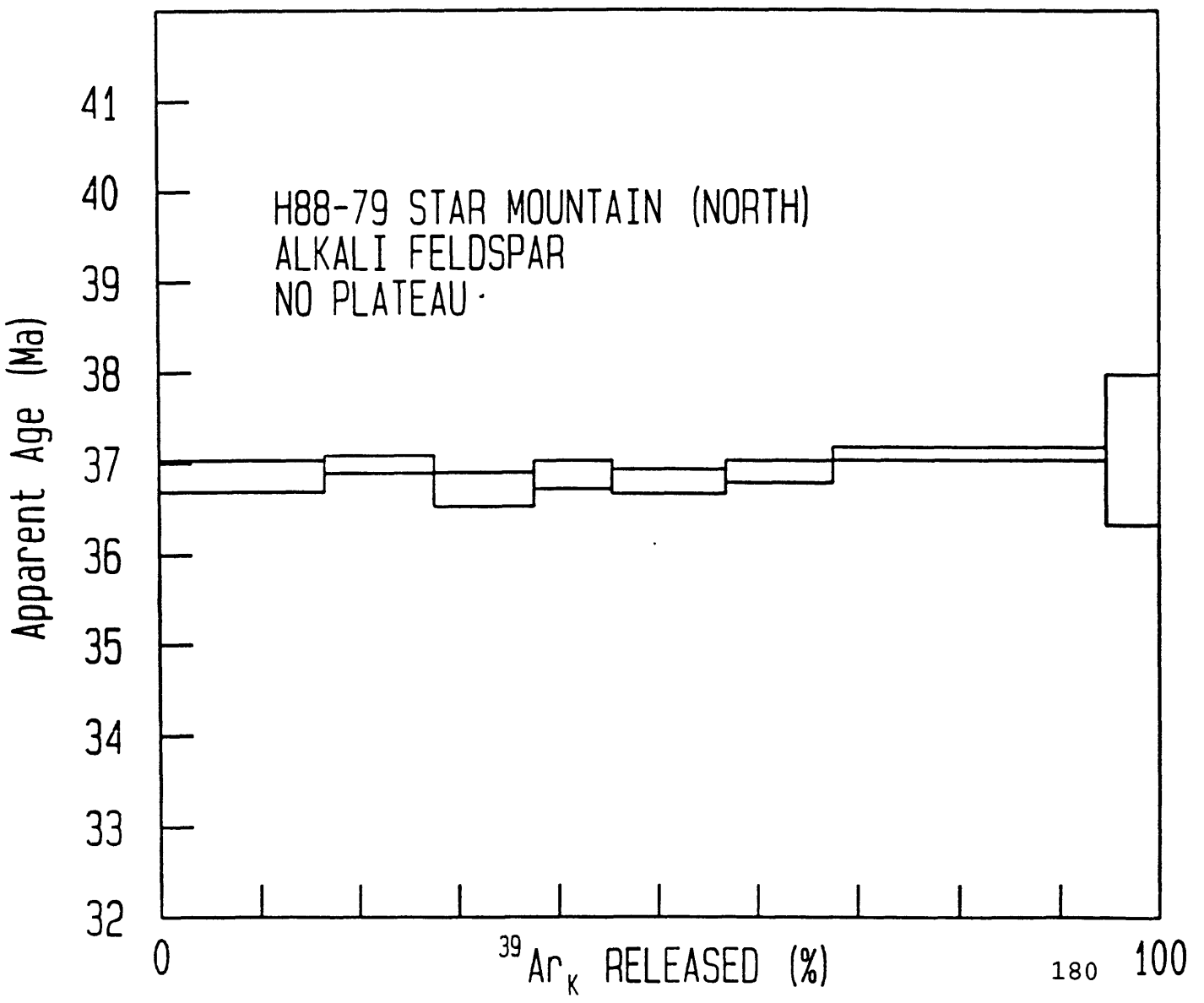
J = 0.004805 + 0.25% SAMPLE WT = 0.5008 g

TEMP C	Initial & radiogenic 40Ar	Potassium derived 39Ar	Chlorine derived 38Ar	Calcium derived 37Ar	Initial 36Ar	AGE* in Ma	**
1000	2.927E-11	6.612E-12	***	3.303E-13	2.910E-15	36.86 +	.08
1100	1.931E-11	4.458E-12	***	2.076E-13	***	36.99 +	.05
1200	1.726E-11	3.983E-12	***	1.540E-13	***	36.71 +	.09
1230	1.362E-11	3.138E-12	***	1.103E-13	***	36.87 +	.08
1270	1.976E-11	4.559E-12	***	1.661E-13	***	36.80 +	.07
1300	1.868E-11	4.292E-12	***	1.583E-13	***	36.90 +	.06
1400	4.715E-11	1.083E-11	***	4.308E-13	1.122E-15	37.10 +	.04
1650	9.527E-12	2.159E-12	***	8.542E-14	***	37.15 +	.41
TOTAL GAS	1.746E-10	4.003E-11	***	1.643E-12	7.608E-15	36.94	

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 02/05/91 15:21:11 7 Feb 1992 H88-79



R A W D A T A

FILE	TEMP	40Ar	39Ar	38Ar	37Ar	36Ar regression	TRAP CURRENT	MANIFOLD OPTION
24569	970	285600	59483	756	2082	90	200	EALL
	+	85	44	12	8	14		
24570	1050	545291	123185	1641	3436	59	200	EALL
	+	245	65	11	8	14		
24571	1150	1302036	298992	3919	7858	63	200	EALL
	+	870	146	12	14	12		
24572	1220	1601689	369583	4835	9583	51	200	EALL
	+	330	80	13	6	6		
24573	1270	1555323	359541	4693	9181	37	200	EALL
	+	634	180	20	10	10		
24574	1320	1557217	360073	4689	9162	39	200	EALL
	+	862	216	9	12	8		
24575	1400	2019783	466021	6038	11872	40	200	EALL
	+	565	162	5	15	8		
24576	1650	372162	83302	1005	2138	45	200	EALL
	+	75	40	10	10	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
970	11	1502	338	798	0	2	0	1	-0	17
1050	24	2481	701	1653	0	4	0	2	0	11
1150	57	5680	1701	4013	0	9	0	4	-0	11
1220	71	6933	2103	4960	0	11	1	4	-0	9
1270	69	6647	2045	4826	0	11	1	4	-0	6
1320	69	6639	2048	4833	0	11	1	4	-0	7
1400	90	8610	2651	6255	0	14	1	5	-0	6
1650	16	1552	474	1118	0	2	0	1	-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-packag
A	970	2.8	90.7	8.61	0	4.342	37.18 +	.57	.58	.61
B	1050	5.8	96.9	10.80	85692	4.275	36.62 +	.28	.29	.35
C	1150	14.1	98.6	11.45	0	4.283	36.68 +	.10	.14	.23
D	1220	17.4	99.1	11.60	0	4.284	36.69 +	.04	.10	.21
E	1270	17.0	99.4	11.78	0	4.286	36.71 +	.07	.12	.22
F	1320	17.0	99.3	11.82	0	4.284	36.69 +	.06	.11	.21
G	1400	22.0	99.5	11.80	0	4.300	36.82 +	.04	.10	.21
H	1650	3.9	96.5	11.71	0	4.298	36.80 +	.11	.14	.23

Total gas K/Ca = 11.6

Precisions are 1 sigma, measured in Ma. Measured 40/36 atm = 297.2 +.5
J = 0.004796 + 0.25% (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

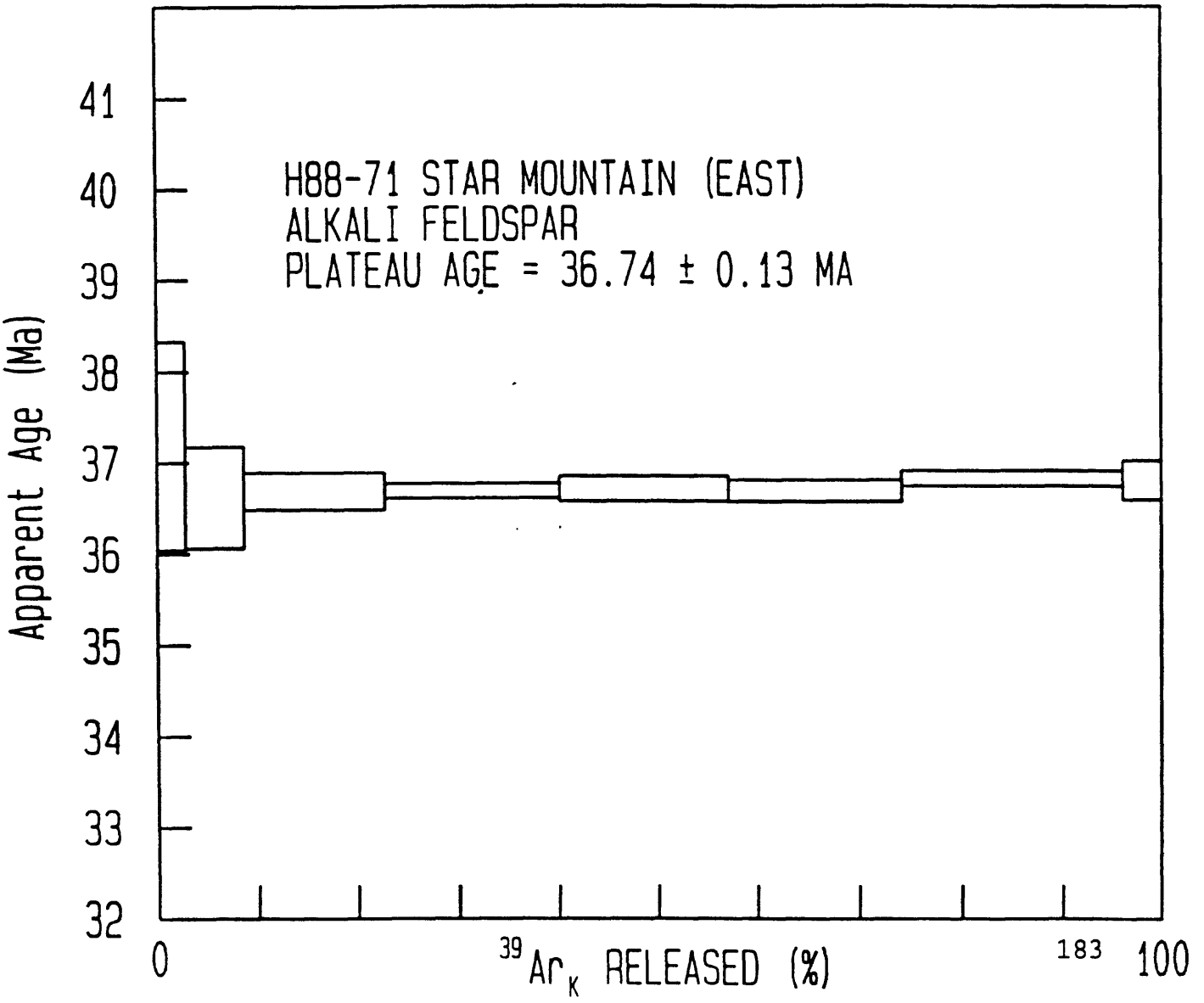
J = 0.004796 + 0.25% SAMPLE WT = 0.5013 g

TEMP C	Initial & radiogenic 40Ar	Potassium derived 39Ar	Chlorine derived 38Ar	Calcium derived 37Ar	Initial 36Ar	AGE* in Ma	**
970	5.705E-12	1.192E-12	***	7.198E-14	1.798E-15	37.18 +	.57
1050	1.089E-11	2.468E-12	***	1.189E-13	1.156E-15	36.62 +	.28
1150	2.601E-11	5.989E-12	***	2.719E-13	1.196E-15	36.68 +	.10
1220	3.199E-11	7.403E-12	***	3.317E-13	9.369E-16	36.69 +	.04
1270	3.107E-11	7.202E-12	***	3.179E-13	***	36.71 +	.07
1320	3.110E-11	7.213E-12	***	3.174E-13	***	36.69 +	.06
1400	4.034E-11	9.335E-12	***	4.114E-13	***	36.82 +	.04
1650	7.434E-12	1.669E-12	***	7.411E-14	8.880E-16	36.80 +	.11
TOTAL GAS	1.845E-10	4.247E-11	***	1.915E-12	8.026E-15	36.73	

100.0% of gas on plateau, steps 970 through 1650 PLATEAU AGE = 36.74 + .1

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 02/05/91 15:45:55 7 Feb 1992 H88-71 [illegible]



v 02/05/91 (40/36in = 295.5)

R A W D A T A

FILE	TEMP	40Ar	39Ar	38Ar	37Ar	36Ar *	TRAP CURRENT	MANIFOLD OPTION
32296	900	828518	183661	2318	303	22	200	EALL
	▪	664	148	12	4	5		
32297	1025	1302319	289392	3675	458	27	200	EALL
	▪	809	176	11	9	10		
32298	1120	480642	106178	1359	178	21	200	EALL
	▪	418	73	4	9	6		
32299	1200	1536195	341402	4301	543	30	200	EALL
	▪	1052	252	6	12	11		
32300	1280	826418	181463	2289	310	18	200	EALL
	▪	321	162	12	3	5		
32301	1380	67149	14098	88	30	6	200	EALL
	▪	87	16	8	12	4		

* 36Ar peak values less than 20 are means those above 20 are from linear regressions

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
900	197	5180	1046	2467	0	4	0	1	-0	4
1025	310	7839	1648	3888	0	6	0	2	-0	5
1120	114	3053	605	1426	0	2	0	1	-0	4
1200	365	9304	1944	4586	0	7	0	3	-0	5
1280	194	5315	1033	2438	0	4	0	1	-0	3
1380	15	519	80	189	0	0	0	0	-0	1

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	16.5	99.3	17.39	0	4.461	36.92 ▪	.07	.12	.22
B 1025	25.9	99.4	18.11	0	4.457	36.89 ▪	.09	.13	.23
C 1120	9.5	98.8	17.06	0	4.455	36.87 ▪	.14	.16	.25
D 1200	30.6	99.5	18.00	0	4.459	36.91 ▪	.08	.12	.22
E 1280	16.3	99.4	16.75	0	4.509	37.32 ▪	.07	.12	.22
F 1380	1.3	97.3	13.33	0	4.618	38.21 ▪	.66	.66	.69
Total gas K/Ca =			17.6						

Precisions are 1 sigma, measured in Ma. Measured 40/36 atm = 297.2 ▪.5
J = 0.004635 ▪ 0.25% (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: 2.07 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

v 06/13/92 20:01:39 17 Apr 1993

H89-68 KSPAR #28&29 RD86

J = 0.004635 ▪ 0.25% SAMPLE WT = 0.4997 g

TEMP C	Initial & radiogenic 40Ar	Potassium derived 39Ar	Chlorine derived 38Ar	Calcium derived 37Ar	Initial 36Ar	AGE* in Ma	**
900	2.526E-11	5.622E-12	***	1.681E-13	***	36.92 ▪	.07
1025	3.971E-11	8.858E-12	***	2.544E-13	***	36.89 ▪	.09
1120	1.466E-11	3.250E-12	***	9.909E-14	***	36.87 ▪	.14
1200	4.684E-11	1.045E-11	***	3.020E-13	***	36.91 ▪	.08
1280	2.520E-11	5.554E-12	***	1.725E-13	***	37.32 ▪	.07
1380	2.048E-12	4.315E-13	***	1.684E-14	***	38.21 ▪	.66
TOTAL GAS	1.537E-10	3.417E-11	***	1.013E-12	3.551E-15	36.98	

82.5% of gas on plateau, steps 900 through 1200 PLATEAU AGE = 36.90 + .13

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

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

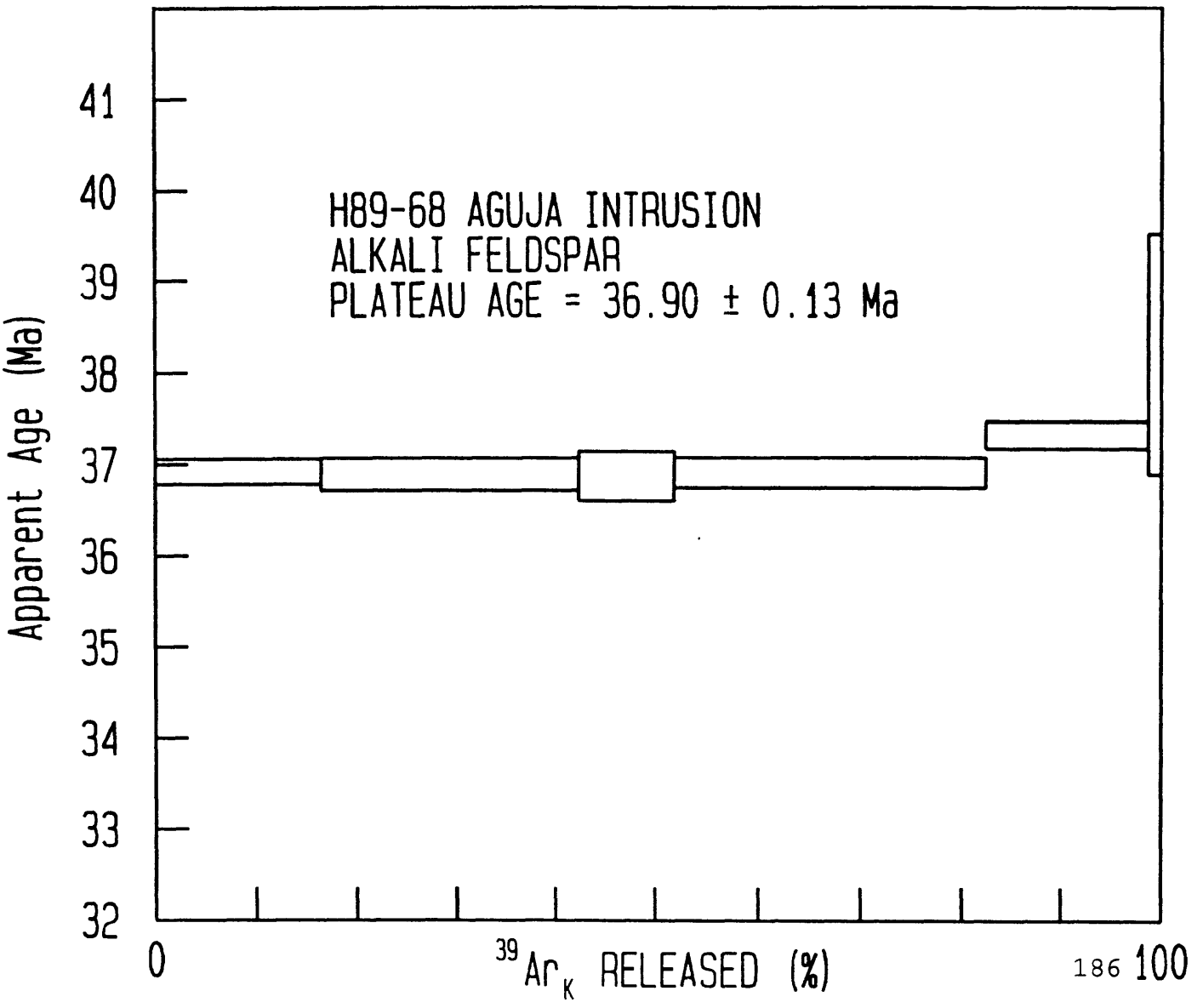
** 1-sigma precision estimates are for intra-sample reproducibility.

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

*** below detection limit

v 06/13/92

v 06/13/92 20:05:26 17 Apr 1993 H89-68 KSPAR #28&29 RD86



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

v 02/05/91 H88-56 17:46:03 7 Feb 1992

R A W D A T A

FILE	TEMP	40Ar	39Ar	38Ar	37Ar	36Ar regression	TRAP CURRENT	MANIFOLD OPTION
24733	970	495633	98435	1456	6333	221	200	ALL
	+	130	70	11	14	7		
24734	1100	820195	189349	2497	11969	26	200	ALL
	+	212	169	10	17	7		
24735	1180	413803	94961	1137	6434	17	200	ALL
	+	93	47	14	14	4		
24736	1240	552035	125551	1661	7665	29	200	ALL
	+	247	18	9	11	5		
24737	1320	2996679	687330	9000	41071	55	200	ALL
	+	2382	524	17	28	9		
24738	1370	384325	87296	1027	5784	15	200	ALL
	+	162	43	19	5	1		

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
970	29	8022	560	1321	0	10	0	4	0	41
1100	56	15180	1077	2541	0	18	1	7	-0	4
1180	28	8168	540	1275	0	10	0	4	-0	2
1240	37	9741	714	1685	0	12	1	5	-0	5
1320	203	52247	3910	9225	0	63	3	25	-0	6
1370	26	7365	497	1172	0	9	0	3	-0	2

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-packag
A	970	7.7	86.9	3.56	1330	4.366	37.51 +	.17	.20	.27
B	1100	14.8	99.3	3.62	0	4.289	36.85 +	.09	.13	.23
C	1180	7.4	99.1	3.37	0	4.305	36.99 +	.12	.15	.24
D	1240	9.8	98.7	3.74	0	4.326	37.17 +	.09	.13	.23
E	1320	53.6	99.7	3.82	0	4.334	37.24 +	.04	.10	.21
F	1370	6.8	99.1	3.44	0	4.351	37.38 +	.04	.10	.21

Total gas K/Ca = 3.7

Precisions are 1 sigma, measured in Ma. Measured 40/36 atm = 297.2 +.5
J = 0.004812 + 0.25% (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 02/05/91 17:46:06 7 Feb 1992

H88-56

J = 0.004812 + 0.25% SAMPLE WT = 0.1767 g

TEMP C	Initial & radiogenic 40Ar	Potassium derived 39Ar	Chlorine derived 38Ar	Calcium derived 37Ar	Initial 36Ar	AGE* in Ma	**
970	4.951E-12	9.860E-13	1.794E-15	1.442E-13	2.187E-15	37.51 +	.17
1100	8.191E-12	1.897E-12	***	2.727E-13	***	36.85 +	.09
1180	4.133E-12	9.512E-13	***	1.467E-13	***	36.99 +	.12
1240	5.513E-12	1.258E-12	***	1.748E-13	***	37.17 +	.09
1320	2.993E-11	6.885E-12	***	9.372E-13	***	37.24 +	.04
1370	3.838E-12	8.744E-13	***	1.321E-13	***	37.38 +	.04
TOTAL GAS	5.655E-11	1.285E-11	1.794E-15	1.808E-12	3.176E-15	37.18	

70.8% of gas on plateau, steps 1180 through 1320 PLATEAU AGE = 37.20 + .1

70.2% of gas on plateau, steps 1240 through 1370 PLATEAU AGE = 37.30 + .1

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

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

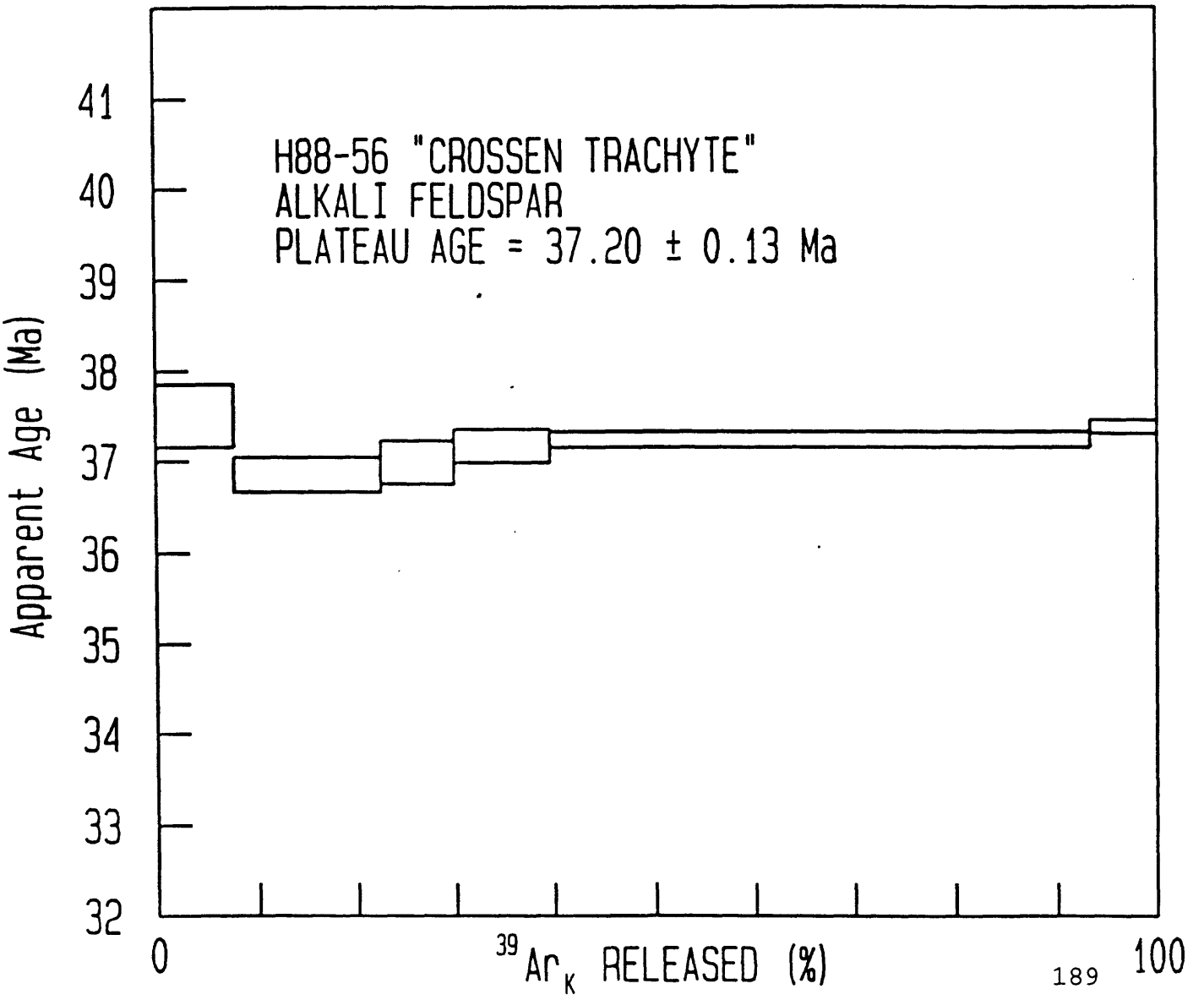
** 1-sigma precision estimates are for intra-sample reproducibility.

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

*** below detection limit

v 02/05/91

v 02/05/91 17:48:33 7 Feb 1992 H88-56 RDT3



v 02/05/91 (40/36in = 295.5)

H87-168

R A W D A T A

FILE	TEMP	40Ar	39Ar	38Ar	37Ar	36Ar mean	TRAP CURRENT	MANIFOLD OPTION
19628:	750	228976	49967	681	1506	69	200	ALL
	±	55	22	34	13	5		
19629:	900	1269042	301729	3905	8649	53	200	ALL
	±	1034	255	39	21	5		
19630:	1075	3353946	801665	10315	22922	72	200	ALL
	±	1575	226	31	16	4		
19631:	1120	2176396	520252	6693	14787	46	200	ALL
	±	829	121	33	30	13		
19632:	1150	1809754	432204	5580	12220	24	200	ALL
	±	295	152	56	13	20		
19633:	1180	1651802	394177	5084	11058	32	200	ALL
	±	560	116	51	17	8		
19634:	1220	1800140	429051	5530	11862	32	200	ALL
	±	919	238	55	26	19		
19635:	1450	1933910	459424	5939	12698	59	200	ALL
	±	1850	421	59	14	8		

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	K-derived 38Ar	K-derived 37Ar	Ca-derived 39Ar	Ca-derived 38Ar	Ca-derived 36Ar	Cl-der 36Ar	Initial 38Ar
750	23	3884	284	670	0	4	0	1	0	13
900	140	22326	1716	4048	0	21	1	8	-0	8
1075	373	59201	4559	10756	0	55	3	22	-0	9
1120	242	38223	2959	6980	0	36	2	14	-0	6
1150	201	31606	2458	5799	0	30	1	12	-0	2
1180	184	28626	2242	5289	0	27	1	11	-0	4
1220	200	30724	2440	5756	0	29	1	11	-0	4
1450	214	32908	2613	6164	0	31	1	12	-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	750	1.5	91.2	4.81	4974	4.169	36.88	±	.26	.28	.33
B	900	8.9	99.0	5.06	0	4.151	36.72	±	.06	.11	.22
C	1075	23.7	99.6	5.07	0	4.154	36.74	±	.02	.10	.21
D	1120	15.4	99.6	5.10	0	4.154	36.74	±	.07	.12	.22
E	1150	12.8	99.8	5.12	0	4.168	36.86	±	.12	.15	.24
F	1180	11.6	99.6	5.16	0	4.163	36.82	±	.05	.11	.21
G	1220	12.7	99.7	5.23	0	4.171	36.89	±	.12	.15	.24
H	1450	13.6	99.3	5.23	0	4.168	36.87	±	.07	.11	.22

Total gas K/Ca = 5.1

Precisions are 1 sigma, measured in Ma. Measured 40/36 atm = 296.5 ±.5
J = 0.004953 ± 0.25% (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 = 6.000E-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±4.0E-03

H87-168

J = 0.004953 ± 0.25% SAMPLE WT = 0.3300 g

TEMP C	Initial & radiogenic 40Ar	Potassium derived 39Ar	Chlorine derived 38Ar	Calcium derived 37Ar	Initial 36Ar	AGE* in Ma	**
750	1.372E-12	3.002E-13	***	3.242E-14	4.080E-16	36.88 ±	.28
900	7.604E-12	1.813E-12	***	1.863E-13	2.682E-16	36.72 ±	.11
1075	2.010E-11	4.816E-12	***	4.940E-13	3.022E-16	36.74 ±	.10
1120	1.304E-11	3.125E-12	***	3.189E-13	***	36.74 ±	.12
1150	1.084E-11	2.596E-12	***	2.636E-13	***	36.86 ±	.15
1180	9.897E-12	2.368E-12	***	2.387E-13	***	36.82 ±	.11
1220	1.079E-11	2.578E-12	***	2.562E-13	***	36.89 ±	.15
1450	1.159E-11	2.760E-12	***	2.743E-13	2.823E-16	36.87 ±	.11
TOTAL GAS	8.523E-11	2.036E-11	***	2.064E-12	1.779E-15	36.80	

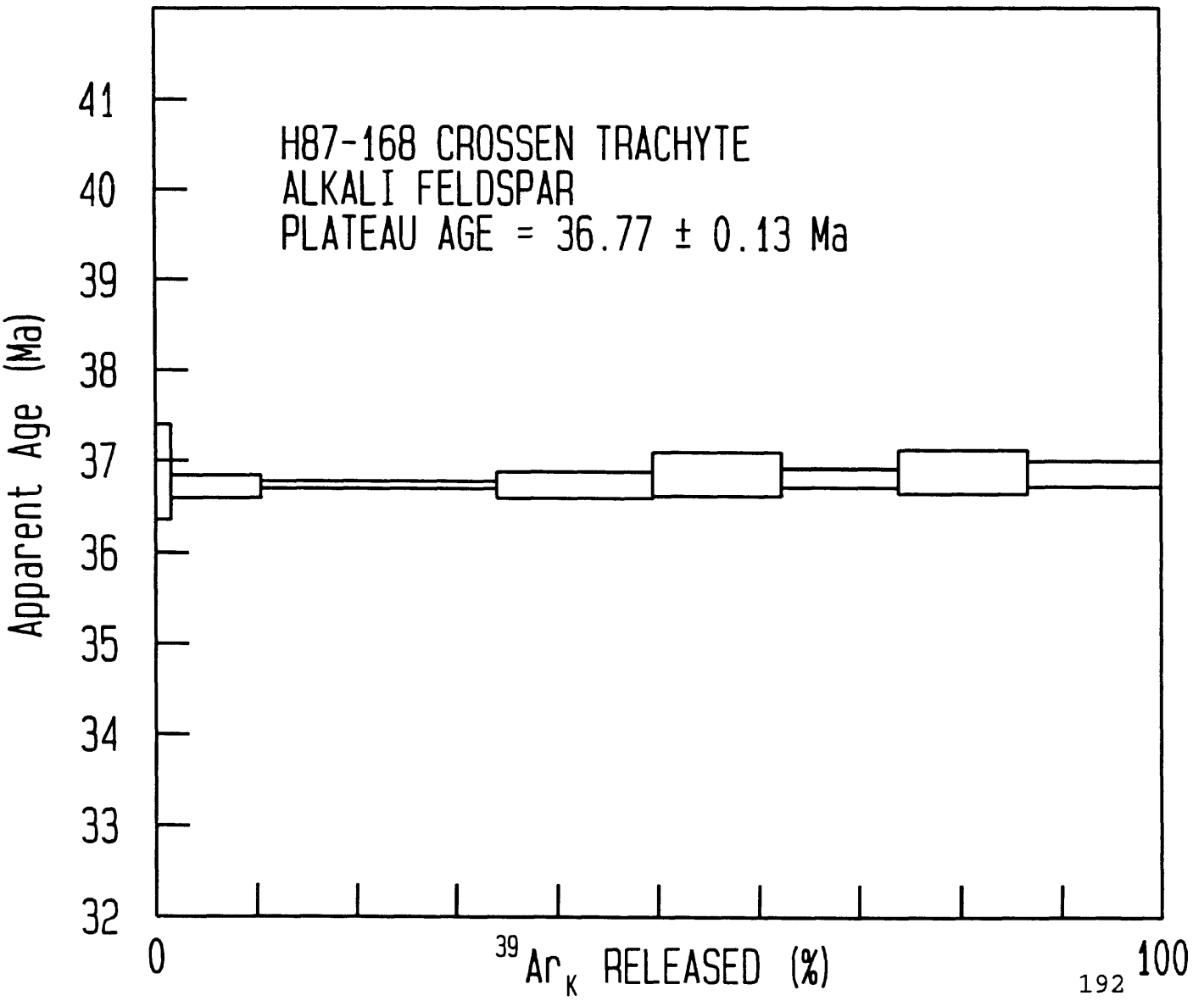
K/Ca = 5.1

100.0% of gas on plateau, steps 750 through 1450 PLATEAU AGE = 36.77 ± .13

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 2/18/89

v 08/23/93 17:12:54 7 Dec 1993



v 08/23/93 (40/36in = 295.5)

H87-205

R A W D A T A

FILE	TEMP	40Ar	39Ar	38Ar	37Ar	36Ar mean	TRAP CURRENT	MANIFOLD OPTION
19619:	750	343434	75271	974	1096	93	200	ALL
	±	94	52	49	8	9		
19620:	900	1548054	356990	4620	4978	145	200	ALL
	±	1493	290	46	10	17		
19621:	1075	5007687	1177682	15146	16149	141	200	ALL
	±	1752	300	45	25	13		
19622:	1120	2890038	680323	8736	9169	71	200	ALL
	±	1330	189	44	20	6		
19623:	1150	2116592	498051	6415	6640	45	200	ALL
	±	1912	460	32	4	5		
19624:	1180	1776103	417752	5378	5556	53	200	ALL
	±	112	98	54	13	12		
19625:	1220	1773281	416918	5364	5492	41	200	ALL
	±	477	58	54	5	20		
19626:	1450	- 1268016	294790	3801	3899	85	200	ALL
	±	606	134	38	16	10		

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	K-derived 38Ar	K-derived 37Ar	Ca-derived 39Ar	Ca-derived 38Ar	Ca-derived 36Ar	Cl-der 36Ar	Initial 38Ar
750	35	2809	428	1010	0	3	0	1	-0	17
900	165	12762	2030	4790	0	12	1	5	-0	26
1075	546	41423	6698	15801	0	39	2	15	-0	24
1120	315	23540	3869	9128	0	22	1	9	-0	12
1150	231	17057	2833	6682	0	16	1	6	-0	7
1180	194	14281	2376	5605	0	13	1	5	-0	9
1220	194	14127	2371	5594	0	13	1	5	-0	7
1450	137	10035	1677	3955	0	9	0	4	-0	15

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	1.9	92.1	10.01	0	4.191	36.56	±	.31	.33	.38
B	900	9.1	97.3	10.45	0	4.209	36.72	±	.13	.16	.24
C	1075	30.1	99.3	10.62	0	4.209	36.72	±	.03	.10	.21
D	1120	17.4	99.4	10.80	0	4.210	36.72	±	.03	.10	.21
E	1150	12.7	99.5	10.92	0	4.215	36.77	±	.05	.11	.21
F	1180	10.7	99.2	10.94	0	4.207	36.69	±	.08	.12	.22
G	1220	10.6	99.4	11.04	0	4.217	36.78	±	.12	.15	.24
H	1450	7.5	98.1	10.99	0	4.209	36.71	±	.09	.13	.23

Total gas K/Ca = 10.8

Precisions are 1 sigma, measured in Ma. Measured 40/36 atm = 296.5 ±.5
J = 0.004885 ± 0.25% (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 = 6.000E-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±4.0E-03

H87-205

J = 0.004885 ± 0.25% SAMPLE WT = 0.3301 g

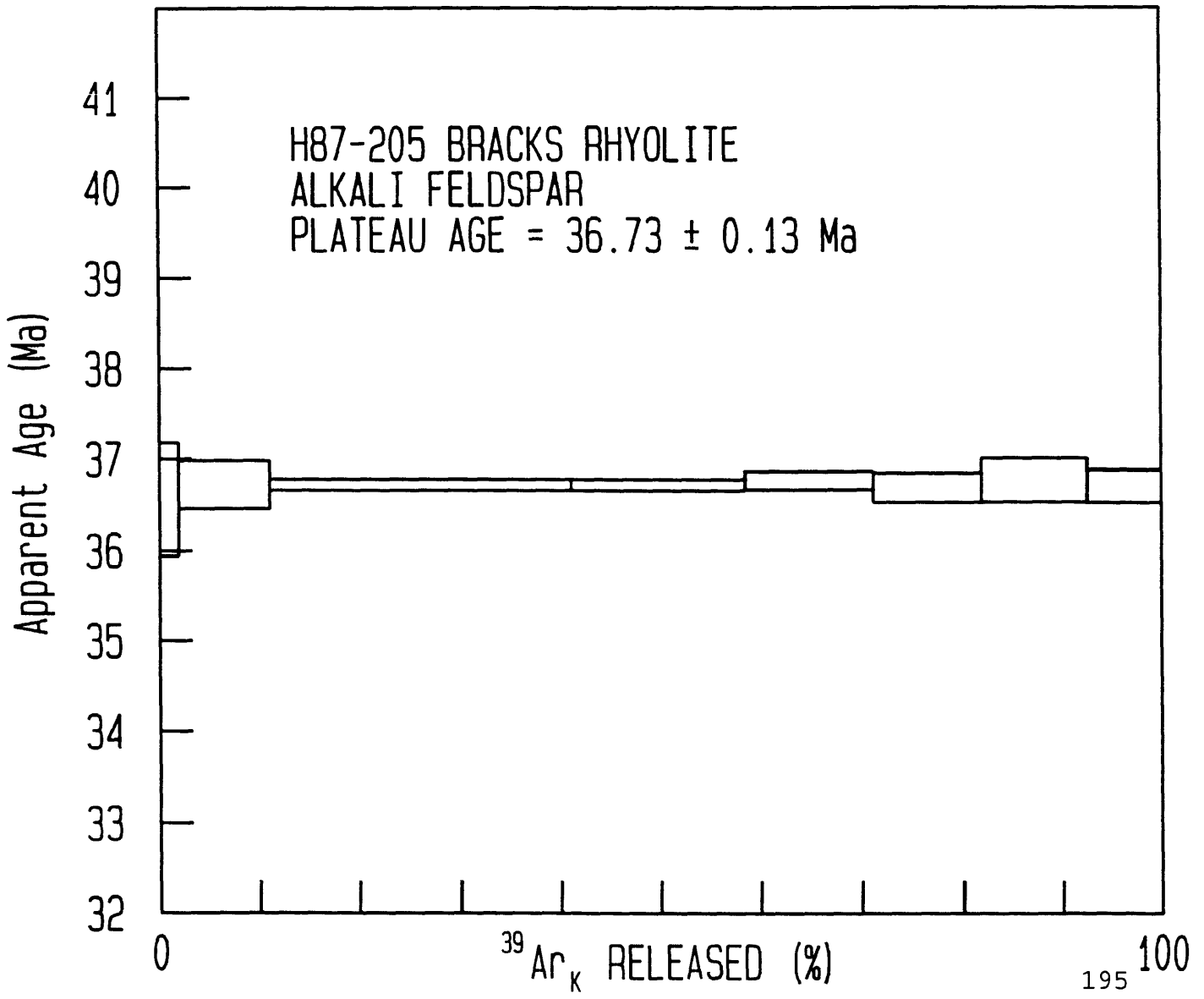
TEMP C	Initial & radiogenic 40Ar	Potassium derived 39Ar	Chlorine derived 38Ar	Calcium derived 37Ar	Initial 36Ar	AGE* in Ma	**
750	2.058E-12	4.522E-13	***	2.349E-14	5.513E-16	36.56 ±	.33
900	9.276E-12	2.145E-12	***	1.067E-13	8.437E-16	36.72 ±	.16
1075	3.001E-11	7.075E-12	***	3.463E-13	7.585E-16	36.72 ±	.10
1120	1.732E-11	4.087E-12	***	1.968E-13	3.728E-16	36.72 ±	.10
1150	1.268E-11	2.992E-12	***	1.425E-13	***	36.77 ±	.11
1180	1.064E-11	2.510E-12	***	1.193E-13	2.877E-16	36.69 ±	.12
1220	1.063E-11	2.505E-12	***	1.180E-13	***	36.78 ±	.15
1450	7.598E-12	1.771E-12	***	8.381E-14	4.879E-16	36.71 ±	.13
TOTAL GAS	1.002E-10	2.354E-11	***	1.137E-12	3.751E-15	36.73	
	K/Ca = 10.8						

100.0% of gas on plateau, steps 750 through 1450 PLATEAU AGE = 36.73 ± .13

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 2/18/89

v 08/23/93 09:47:46 8 Dec 1993



v 08/23/93 (40/36in = 295.5)

v 06/13/92 H89-177 #6 RD86 KSPAR 10:17:05 24 Feb 1993

R A W D A T A

FILE	TEMP	40Ar	39Ar	38Ar	37Ar	36Ar	TRAP CURRENT	MANIFOLD OPTION
					ä	*		
32381	900	303777	44200	656	101	344	200	EALL
	▪	511	60	10	2	4		
32382	1025	676735	144452	1889	317	67	200	EALL
	▪	1301	255	6	2	4		
32383	1120	1060837	227130	2930	490	84	200	EALL
	▪	2130	503	9	6	3		
32384	1200	1334719	284027	3682	612	71	200	EALL
	▪	2326	241	22	7	4		
32385	1280	1569378	323050	4221	702	260	200	EALL
	▪	3113	695	11	4	3		
32386	1380	1527406	241712	3339	512	1415	200	EALL
	▪	3401	335	14	7	7		
32387	1450	223935	23085	217	62	401	200	EALL
	▪	601	21	7	3	3		

* 36Ar peak values less than 10 are means those above 10 are from linear regressions

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	49	1933	252	594	0	1	0	1	0	65
1025	160	6048	823	1941	0	4	0	2	-0	12
1120	252	9360	1293	3051	0	7	0	3	-0	15
1200	315	11683	1617	3816	0	8	0	3	-0	13
1280	358	13416	1840	4340	0	10	0	4	-0	48
1380	268	9776	1377	3247	0	7	0	3	0	266
1450	26	1185	131	310	0	1	0	0	-0	75

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	3.4	66.4	11.27	835	4.546	36.51	▪	.21	.24	.30
B	1025	11.2	97.1	11.78	0	4.533	36.40	▪	.09	.13	.23
C	1120	17.6	97.7	11.97	0	4.547	36.51	▪	.08	.12	.22
D	1200	22.1	98.5	11.99	0	4.611	37.02	▪	.07	.12	.22
E	1280	25.1	95.1	11.88	0	4.604	36.97	▪	.08	.12	.22
F	1380	18.8	72.5	12.19	1596	4.565	36.66	▪	.13	.16	.25
G	1450	1.8	46.8	9.61	0	4.521	36.31	▪	.35	.37	.41

Total gas K/Ca = 11.9

Precisions are 1 sigma, measured in Ma. Measured 40/36 atm = 297.3 ▪.5
J = 0.004497 ▪ 0.25% (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: 2.07 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

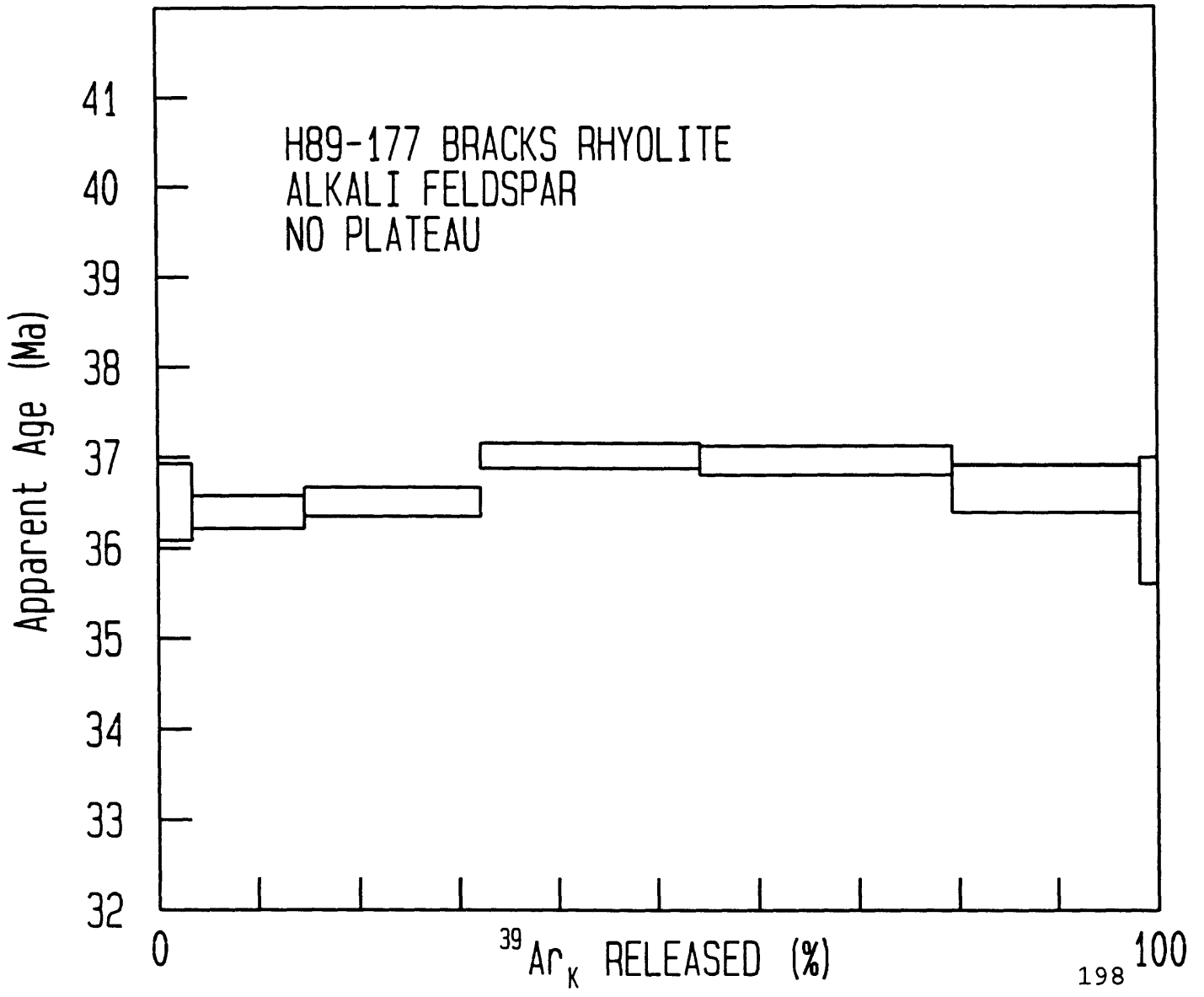
J = 0.004497 ▪ 0.25% SAMPLE WT = 0.0805 g

TEMP C	Initial & radiogenic 40Ar	Potassium derived 39Ar	Chlorine derived 38Ar	Calcium derived 37Ar	Initial 36Ar	AGE* in Ma		**
900	9.267E-12	1.353E-12	3.921E-15	6.240E-14	1.055E-14	36.51	▪	.21
1025	2.064E-11	4.422E-12	***	1.952E-13	2.012E-15	36.40	▪	.09
1120	3.235E-11	6.953E-12	***	3.021E-13	2.495E-15	36.51	▪	.08
1200	4.070E-11	8.695E-12	***	3.771E-13	2.078E-15	37.02	▪	.07
1280	4.786E-11	9.889E-12	***	4.330E-13	7.886E-15	36.97	▪	.08
1380	4.659E-11	7.399E-12	1.122E-14	3.155E-13	4.337E-14	36.66	▪	.13
1450	6.833E-12	7.067E-13	***	3.824E-14	1.231E-14	36.31	▪	.35
TOTAL GAS	2.042E-10	3.942E-11	1.514E-14	1.724E-12	8.070E-14	36.75		

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

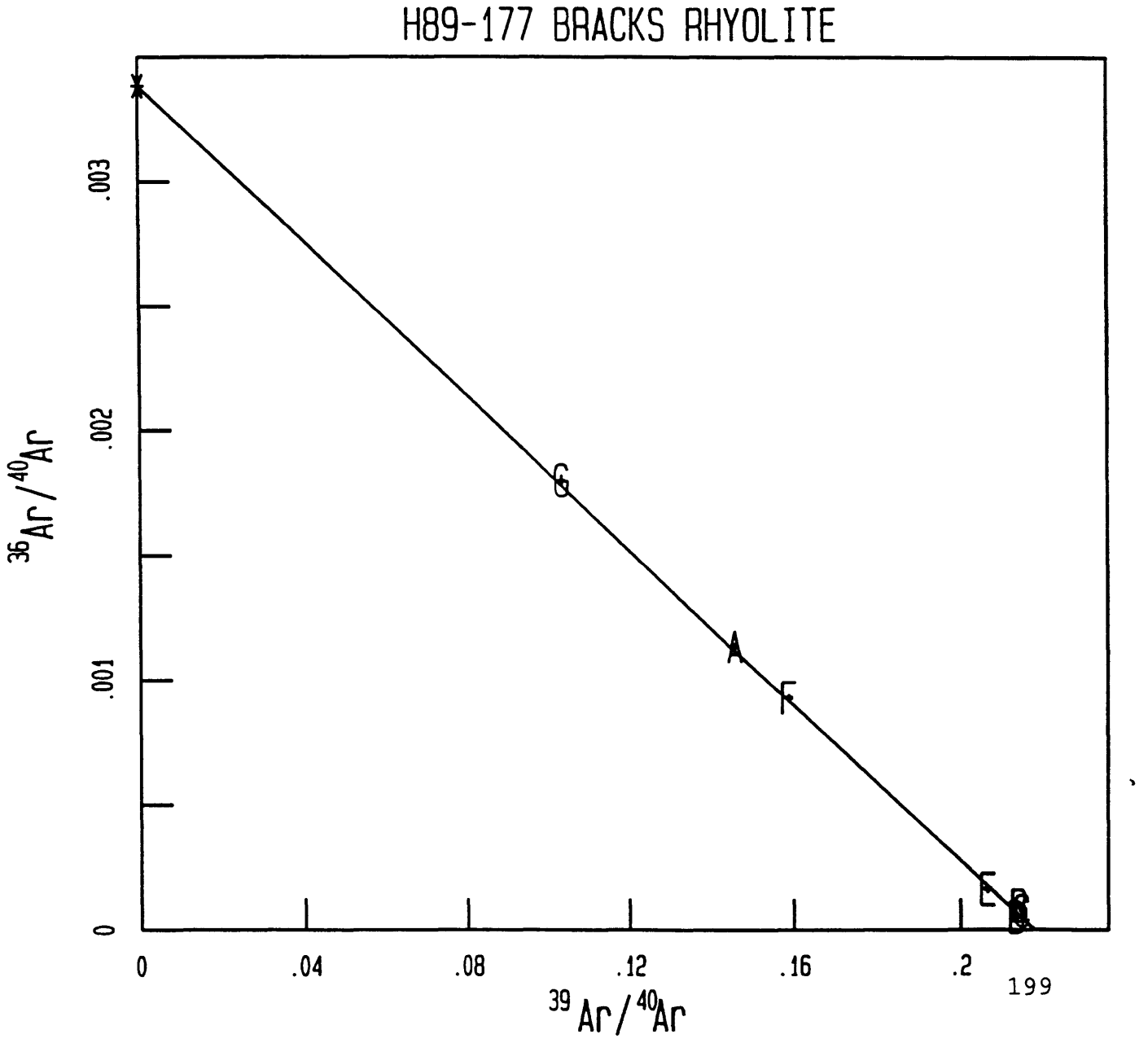
v 08/23/93 09:55:35 8 Dec 1993



v 08/23/93 (40/36in = 295.5)

v 06/13/92 10:25:42 24 Feb 1993 H89-177 #6 RD86 KSPAR

7 points regressed out of 7
Mean X = .184E+00 Mean Y = .551E-03 Slope = -.156E-01 ä+Ç .181E-03
36/40 = .341E-02 ä+Ç .340E-04 39/40 = .219E+00 ä+Ç .593E-03
Fit parameters: SUMS = 8.387 MSWD = 1.677
40Ar/36Ar = 293.11 ä+Ç 2.92 F = 4.568 ä+Ç .012 AGE = 36.69 ä+Ç .13 Ma



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