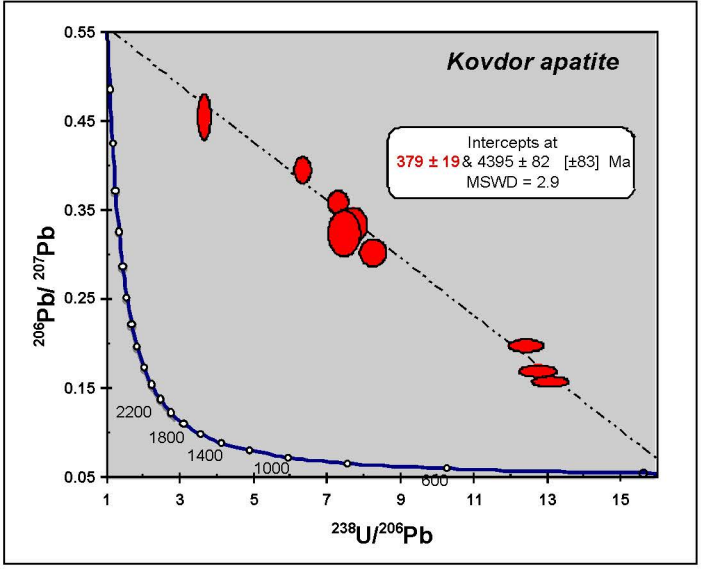
Villaseca, C., Belousova, E.A., Barfod, D.N., and González-Jiménez, J.M., 2019, Dating metasomatic events in the lithospheric mantle beneath the Calatrava volcanic field (central Spain): Lithosphere, https://doi.org/10.1130/L1030.1.

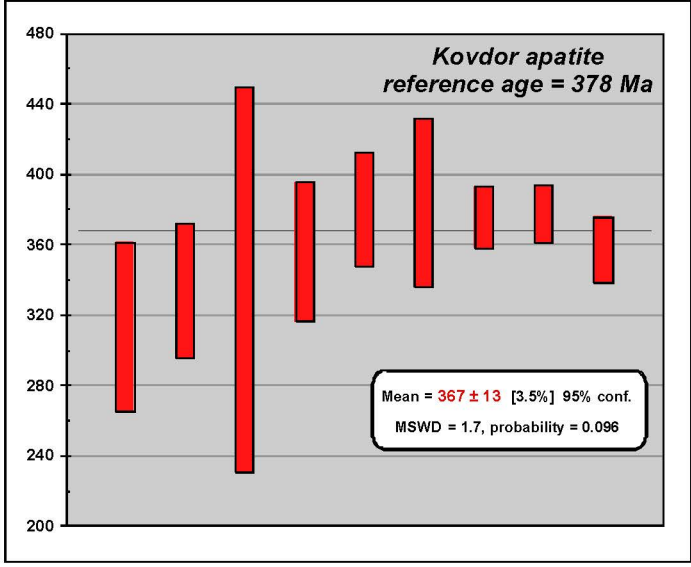
GSA Data Repository Item 2019031

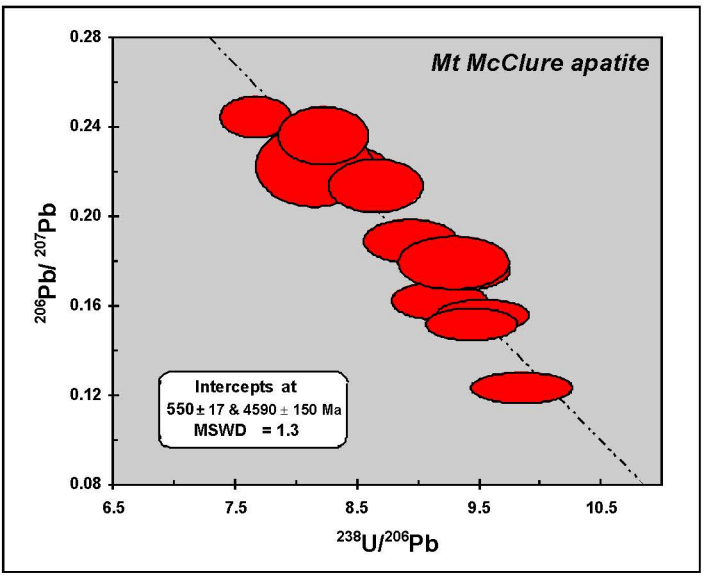
Data Repository Figure DR1. Tera Wasseburg Concordia diagrams (left column) and weighted average ^{207}Pb corrected ages (right column) for the Kovdor, Mt McClure and Emerald Lake apatite standards during LA-ICPMS analyses. Reference ages are included for comparison. See text for further explanations.

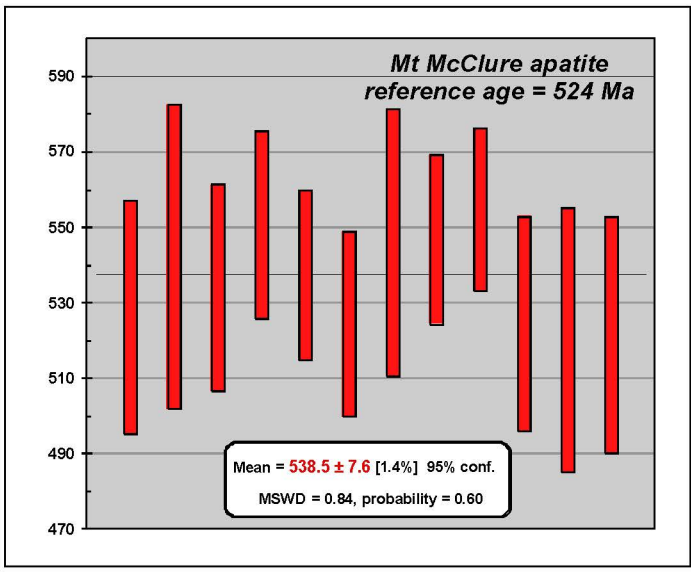
Data Repository Figure DR2. $^{40}Ar/^{39}Ar$ incremental heating results and inverse isochrons plots for amphibole megacryst of the olivine melilitite 114404, and for metasomatic amphiboles of wehrlite 111657 and lherzolite 111658, all samples from the El Aprisco maar. For the plateau age, the height of the box for a given step reflects the associated uncertainty. The inverse isochron plots for amphiboles in the peridotite samples reflect a mixture of excess, atmospheric and radiogenic argon, where early steps are dominated by an excess ^{40}Ar component (see also Table 2). The youngest coherent groups of high-temperature steps form arrays that intercept an atmospheric trapped component and are tentatively interpreted as reflecting a maximum closure age, although, some arrays are based on very few points (n = 2 and n = 3 for 111657 and 111658 amphiboles, Table 2). Age values for the amphibole megacryst (114404) from the El Aprisco melilitite in these plots integrate the two subsets (a and b) of mineral concentrates. See text for further explanation.

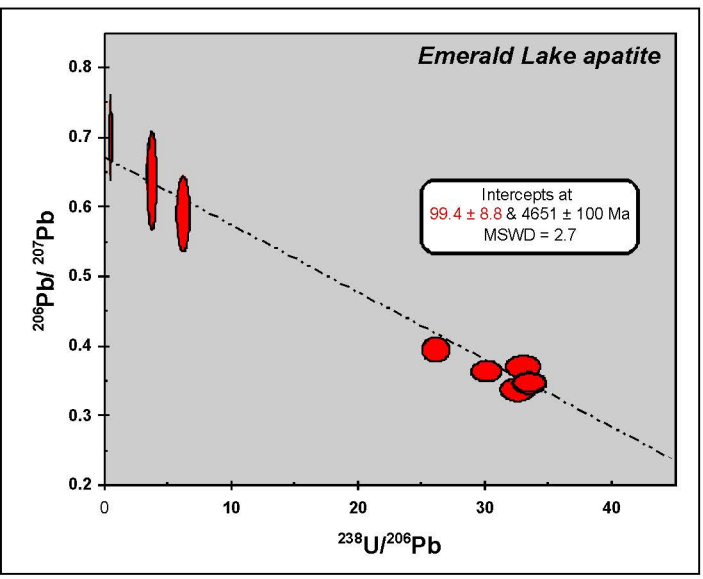
Data Repository Figure DR3. $^{40}Ar/^{39}Ar$ incremental heating results and inverse isochrons plots for megacrystic 111653 amphibole and 114403 phlogopite of the olivine nephelinite from the Cerro Pelado scoria cone. For the plateau age, the height of the box for a given step reflects the associated uncertainty; the horizontal line represents the plateau. See also Table 2 and text for further explanation.

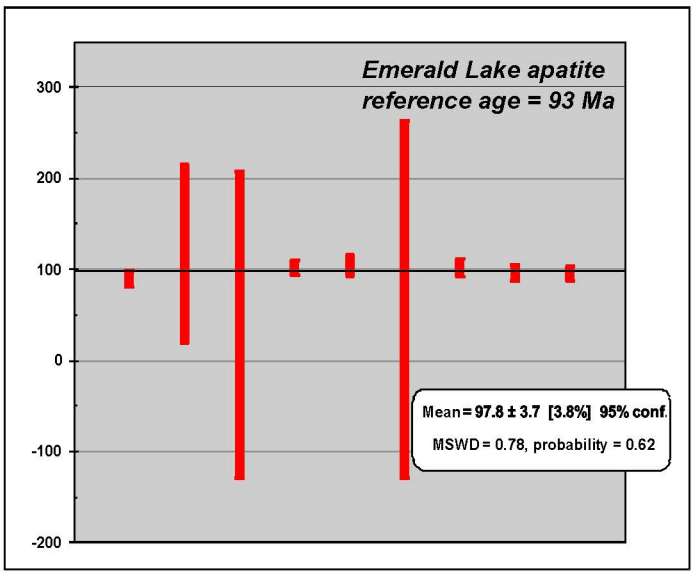

Kovdor apatite
Intercepts at
379 ± 19 & 4395 ± 82 [±83] Ma
MSWD = 2.9
2200
1800
1400
1000
600
$^{206}Pb/^{207}Pb$
$^{238}U/^{206}Pb$

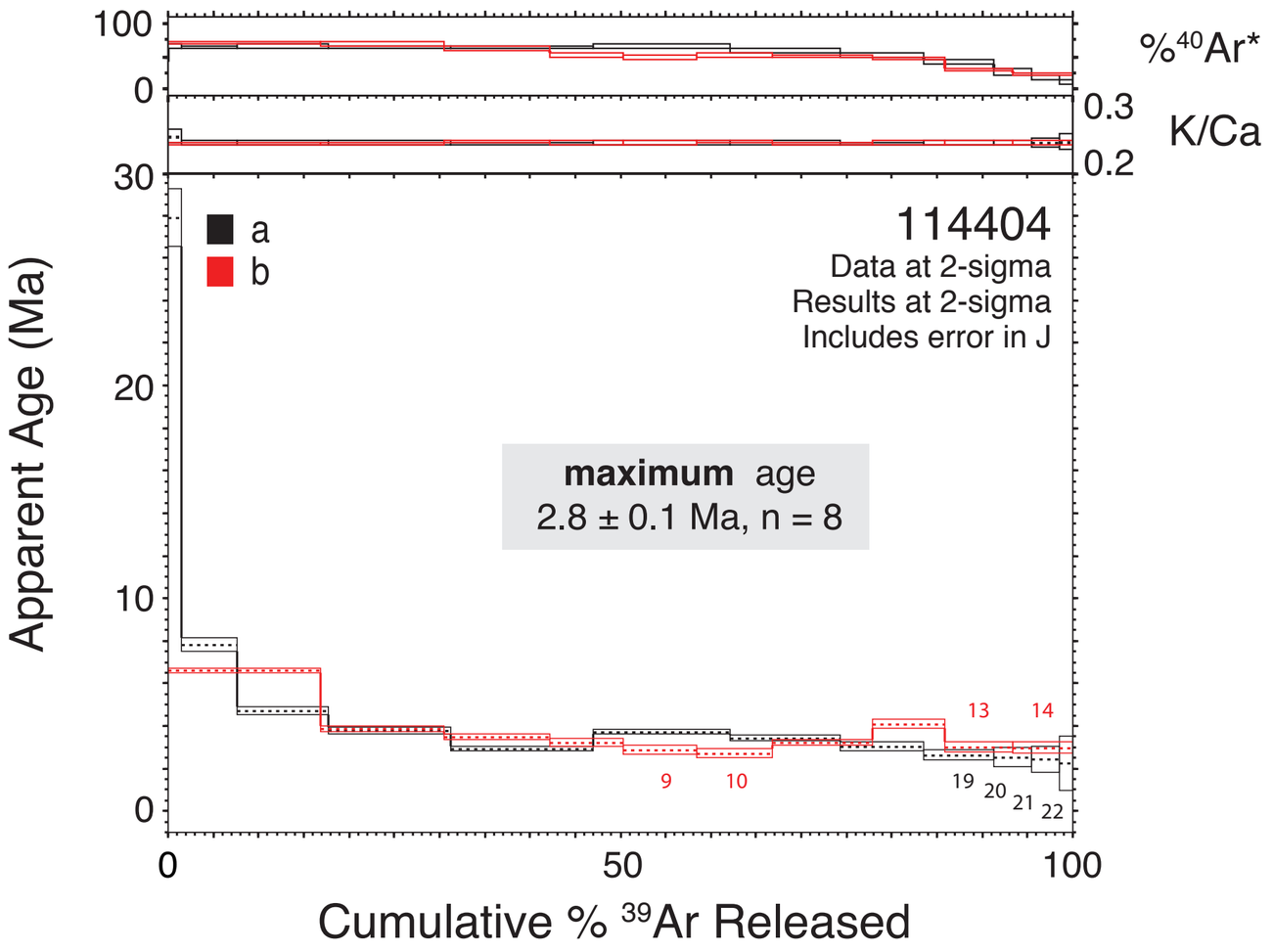

Kovdor apatite
reference age = 378 Ma
Mean = 367 ± 13 [3.5%] 95% conf.
MSWD = 1.7, probability = 0.096

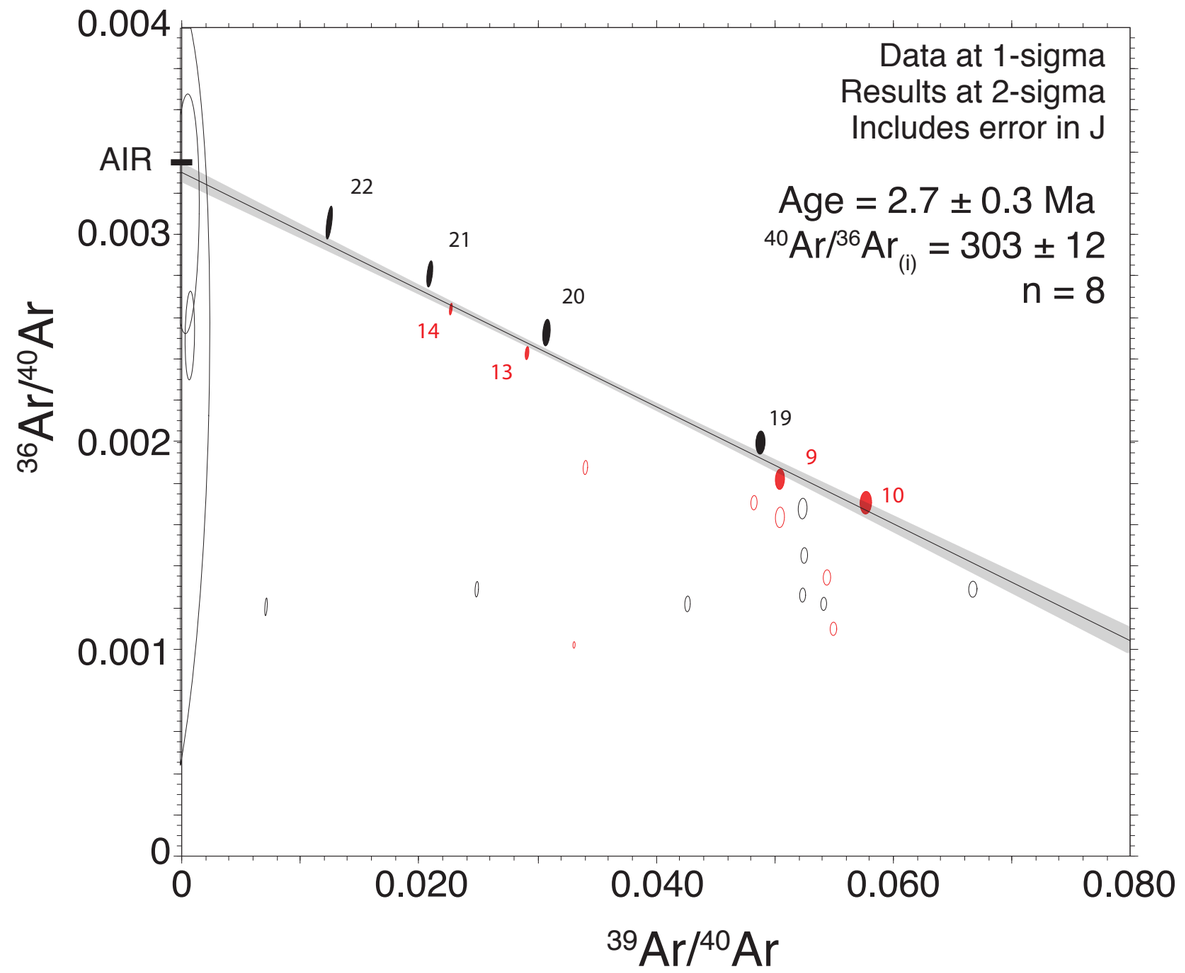

Mt McClure apatite
Intercepts at
550 ± 17 & 4590 ± 150 Ma
MSWD = 1.3
$^{206}Pb/^{207}Pb$
$^{238}U/^{206}Pb$

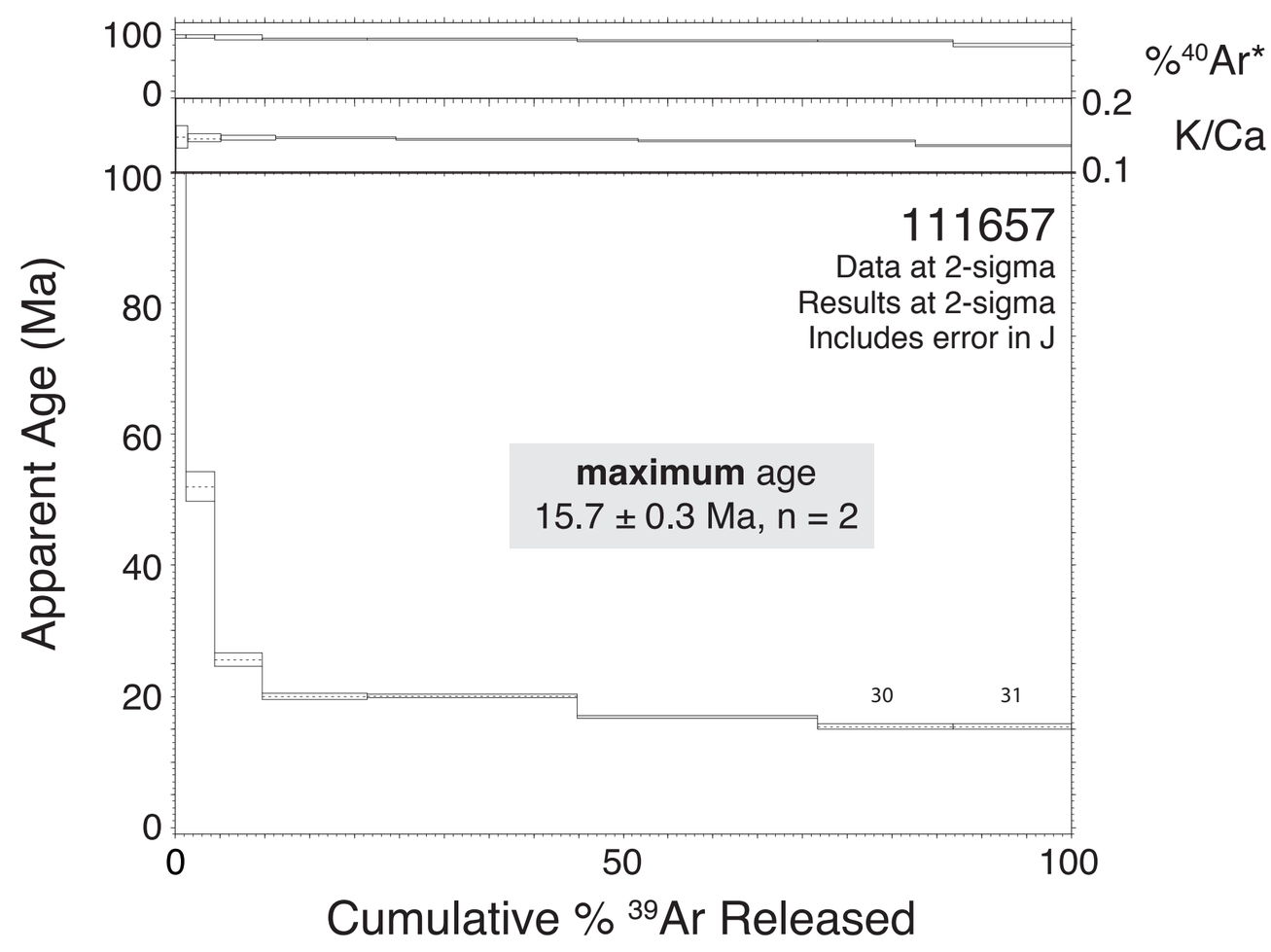

Mt McClure apatite
reference age = 524 Ma
Mean = 538.5 ± 7.6 [1.4%] 95% conf.
MSWD = 0.84, probability = 0.60

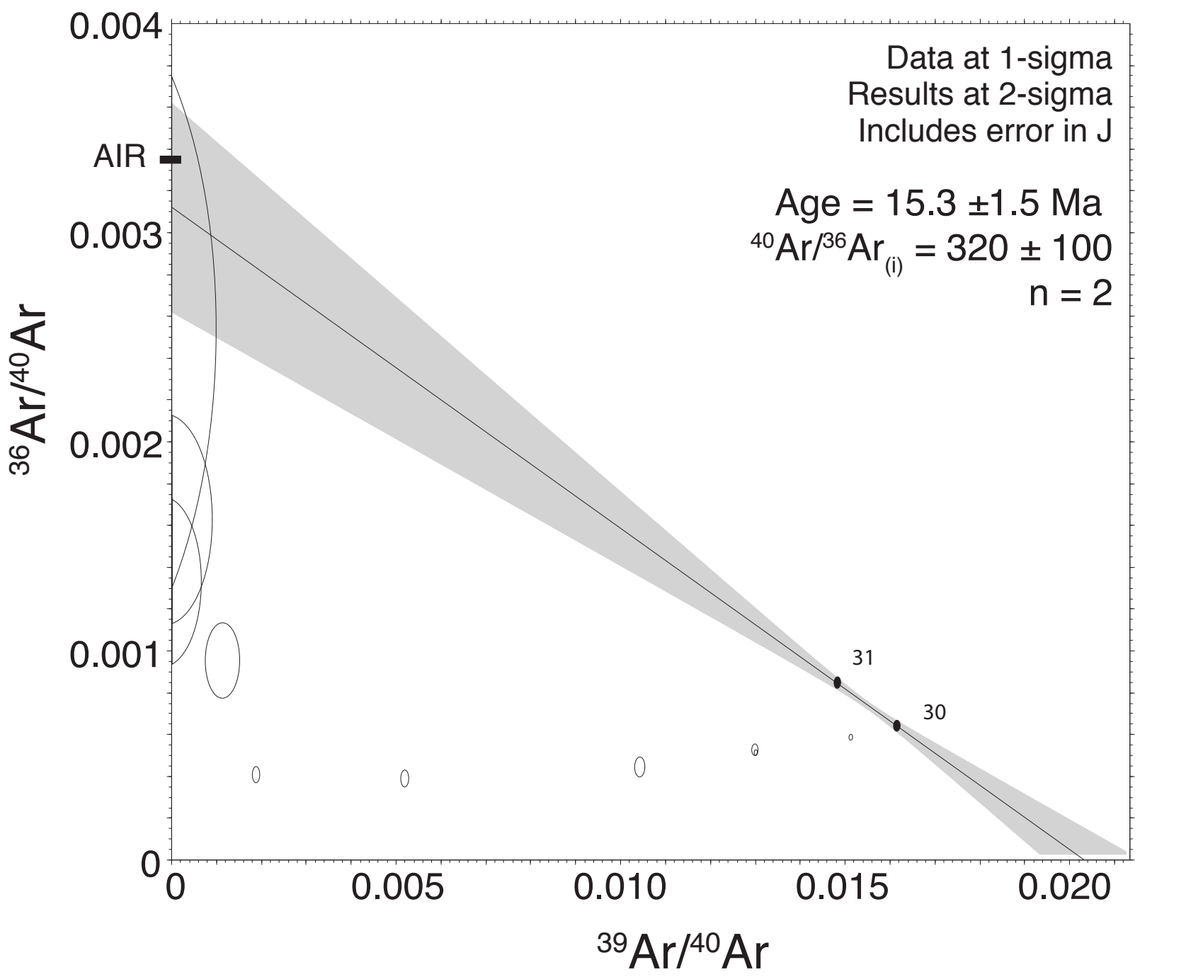

Emerald Lake apatite
Intercepts at
99.4 ± 8.8 & 4651 ± 100 Ma
MSWD = 2.7
$^{206}Pb/^{207}Pb$
$^{238}U/^{206}Pb$

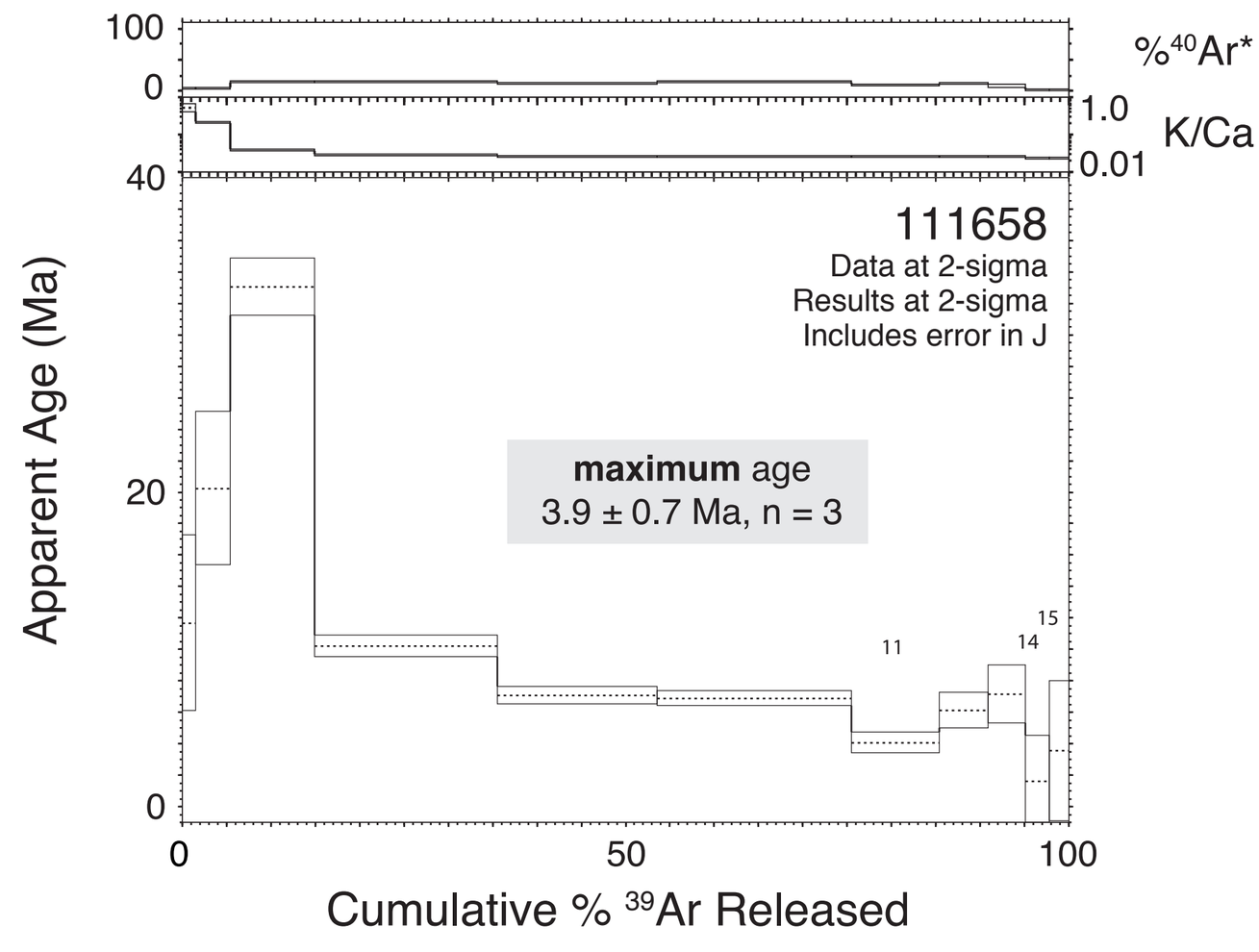

Emerald Lake apatite
reference age = 93 Ma
Mean = 97.8 ± 3.7 [3.8%] 95% conf.
MSWD = 0.78, probability = 0.62

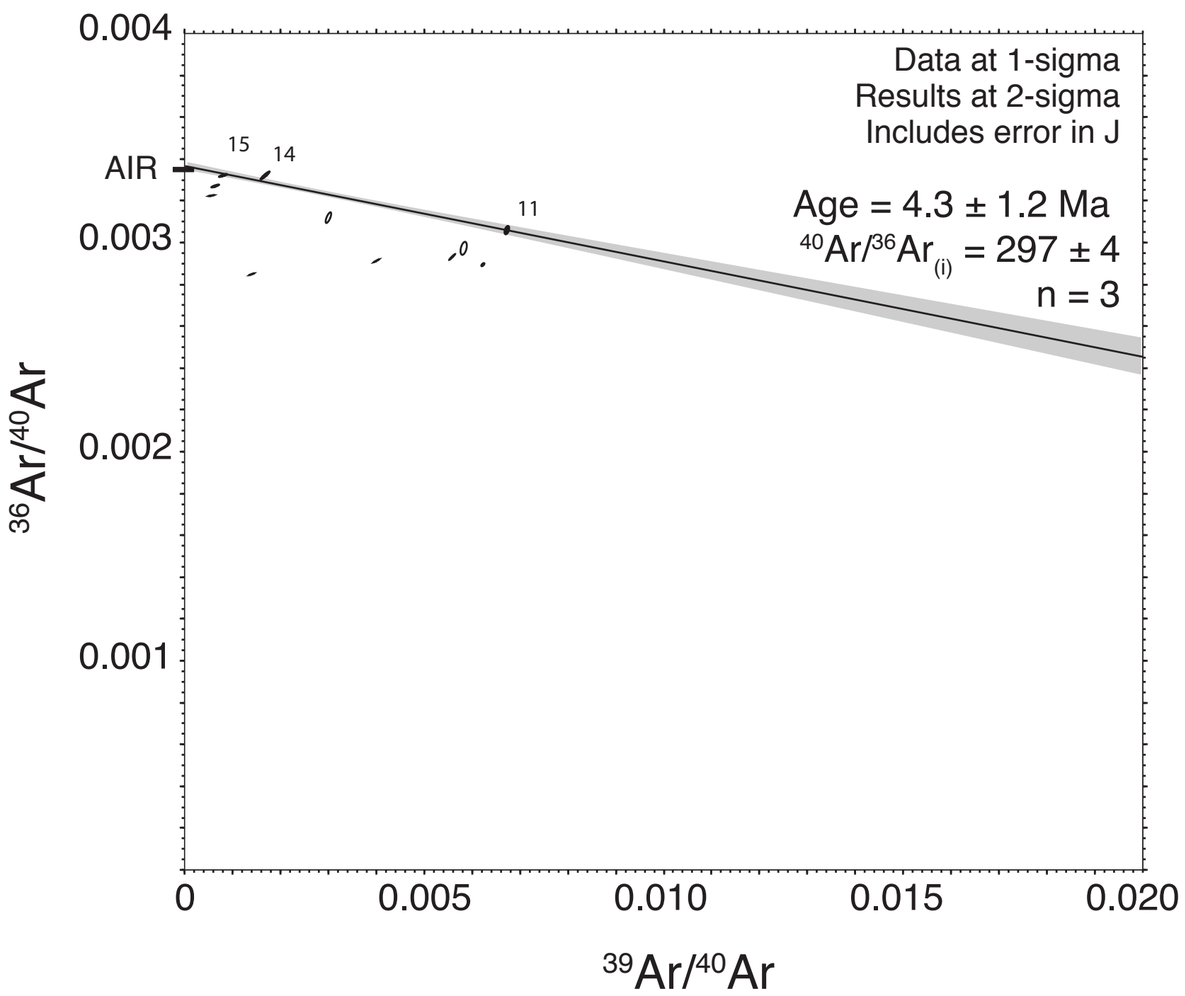

%40Ar*
K/Ca
a
b
114404
Data at 2-sigma
Results at 2-sigma
Includes error in J
maximum age
2.8 ± 0.1 Ma, n = 8
Apparent Age (Ma)
Cumulative % 39Ar Released

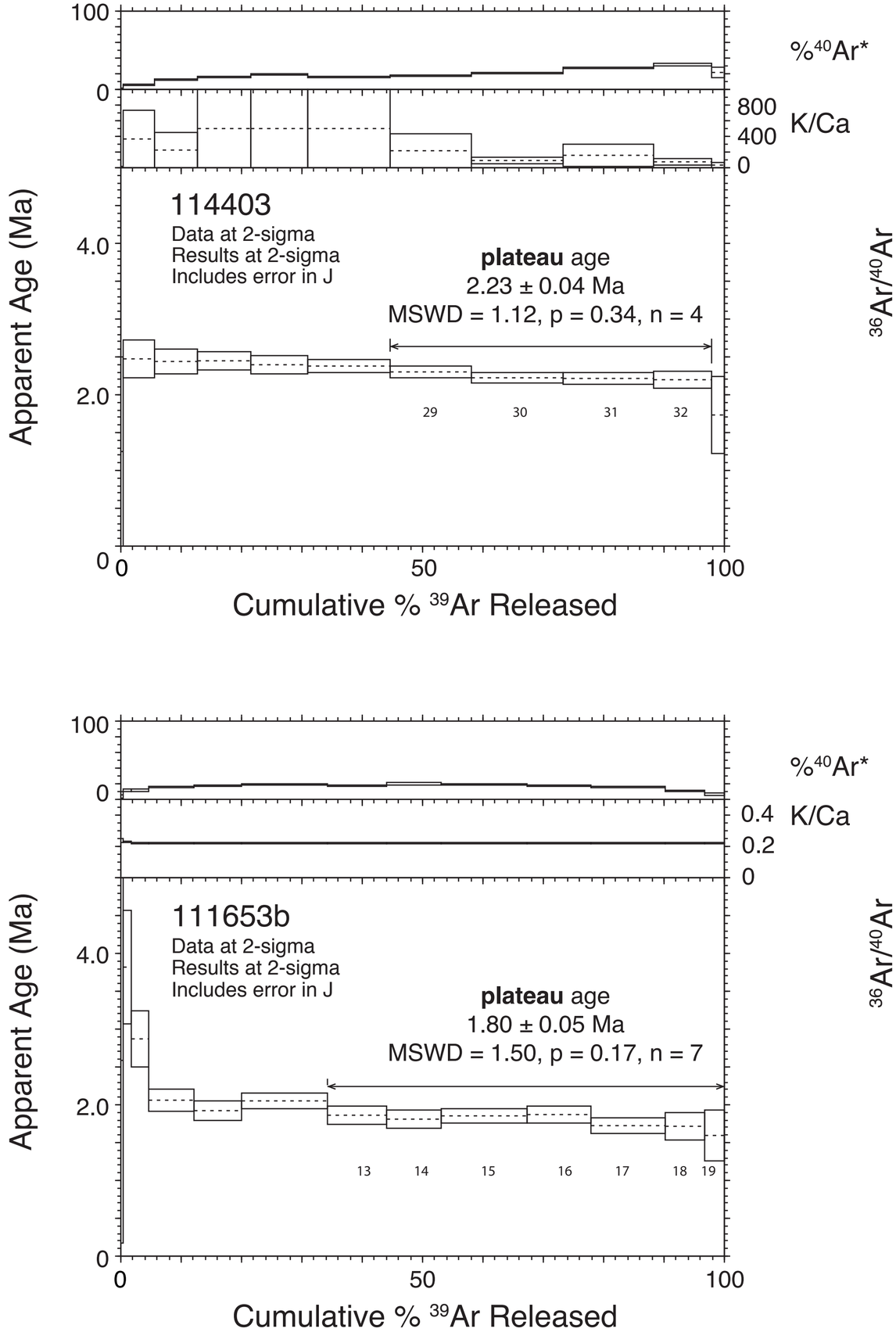

Data at 1-sigma
Results at 2-sigma
Includes error in J
Age = 2.7 ± 0.3 Ma
40Ar/36Ar(i) = 303 ± 12
n = 8
AIR
36Ar/40Ar
39Ar/40Ar

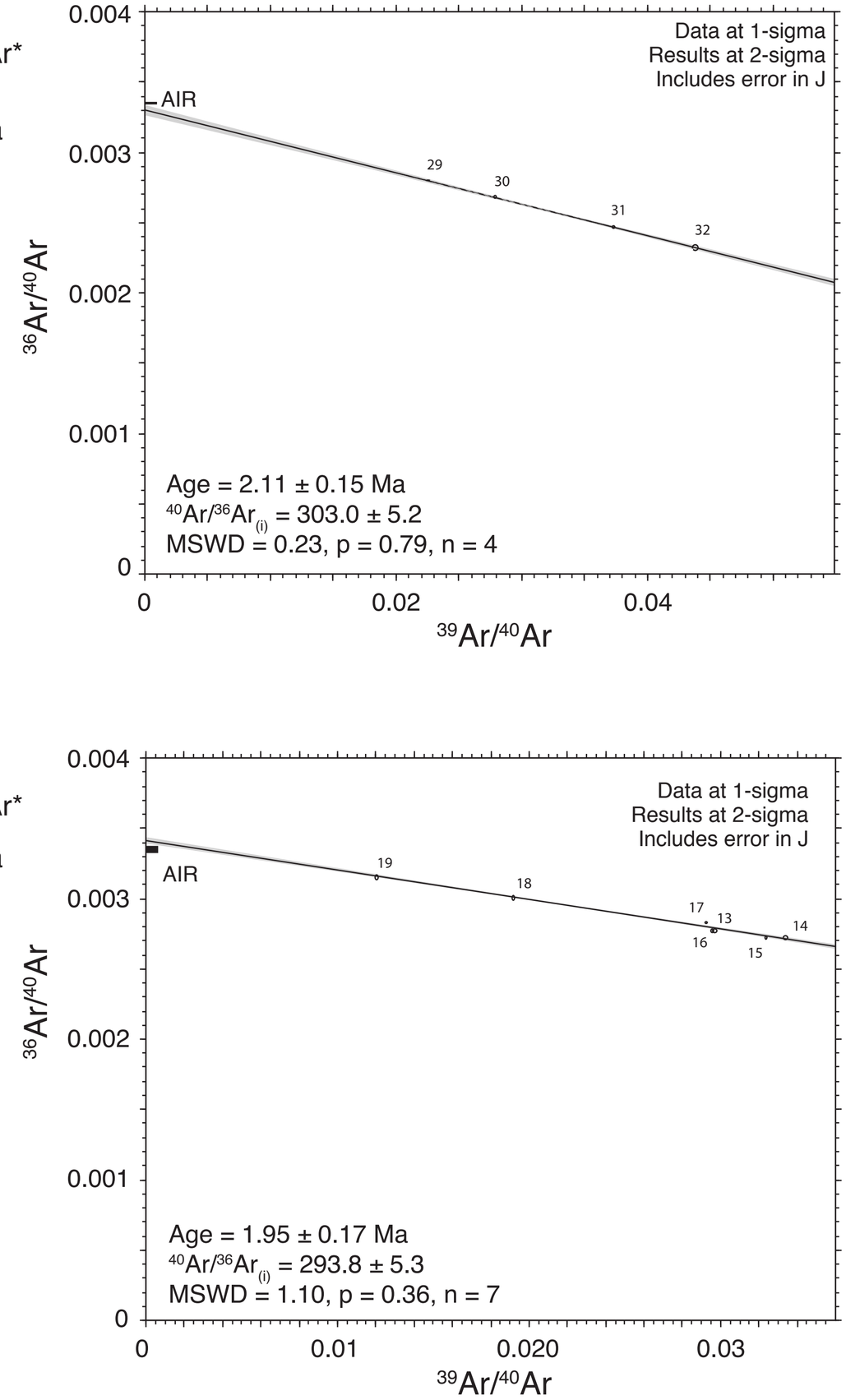

%40Ar*
K/Ca
111657
Data at 2-sigma
Results at 2-sigma
Includes error in J
maximum age
15.7 ± 0.3 Ma, n = 2
Apparent Age (Ma)
Cumulative % 39Ar Released


Data at 1-sigma
Results at 2-sigma
Includes error in J
Age = 15.3 ±1.5 Ma
40Ar/36Ar(i) = 320 ± 100
n = 2
AIR
36Ar/40Ar
39Ar/40Ar


%40Ar*
K/Ca
111658
Data at 2-sigma
Results at 2-sigma
Includes error in J
maximum age
3.9 ± 0.7 Ma, n = 3
Apparent Age (Ma)
Cumulative % 39Ar Released


Data at 1-sigma
Results at 2-sigma
Includes error in J
Age = 4.3 ± 1.2 Ma
40Ar/36Ar(i) = 297 ± 4
n = 3
AIR
36Ar/40Ar
39Ar/40Ar


100
0
800
400
0
%40Ar*
K/Ca
114403
Data at 2-sigma
Results at 2-sigma
Includes error in J
plateau age
2.23 ± 0.04 Ma
MSWD = 1.12, p = 0.34, n = 4
29
30
31
32
4.0
2.0
0
0
50
100
Apparent Age (Ma)
Cumulative % 39Ar Released


0.004
0.003
0.002
0.001
0
Data at 1-sigma
Results at 2-sigma
Includes error in J
AIR
29
30
31
32
Age = 2.11 ± 0.15 Ma
40Ar/36Ar(i) = 303.0 ± 5.2
MSWD = 0.23, p = 0.79, n = 4
0
0.02
0.04
36Ar/40Ar
39Ar/40Ar

100
0
0.4
0.2
0
%40Ar*
K/Ca
111653b
Data at 2-sigma
Results at 2-sigma
Includes error in J
plateau age
1.80 ± 0.05 Ma
MSWD = 1.50, p = 0.17, n = 7
13
14
15
16
17
18
19
4.0
2.0
0
0
50
100
Apparent Age (Ma)
Cumulative % 39Ar Released

0.004
0.003
0.002
0.001
0
Data at 1-sigma
Results at 2-sigma
Includes error in J
AIR
19
18
17
13
16
15
14
Age = 1.95 ± 0.17 Ma
40Ar/36Ar(i) = 293.8 ± 5.3
MSWD = 1.10, p = 0.36, n = 7
0
0.01
0.020
0.03
36Ar/40Ar
39Ar/40Ar