New Mexico Bureau of Geology and Mineral Resources Open File AR-4

$^{40}Ar/^{39}Ar$ analytical data from the Juniper Mountain volcanic center, Owyhee County, Southwestern Idaho
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Tables and Figures to accompany:

Manley, C.M., and McIntosh, W.C., in press,
The Juniper Mountain Volcanic Center, Owyhee County, Southwestern Idaho: Age Relations And Physical Volcanology
Idaho Geological Survey Special Publication

Tables and figures in Excel 2001 format.

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Table 1. Summary of $^{40}Ar/^{39}Ar$ results analytical methods.

Sample	Unit	Location	L#	n	K/Ca	±2σ	Age	±2σ
JM92-328	Badlands equiv	Garat Xing	8992	16	24.2	4.4	13.65	0.04
JM92-280	Badlands	type section	8989	15	24.1	12.2	13.73	0.08
JM92-325	Tuff of Mill Creek	Mill Creek	8993	15	26.9	6.8	13.77	0.12
JM91-252	Beaver Creek Tuff	Beaver Creek	8994	16	25.3	2.2	13.82	0.05
JM91-126	Dickshooter	Dickshooter	8996	15	32.2	2.5	13.83	0.04
JM92-316	Carter Spring	Carter Spring	8987	15	28.0	4.6	13.89	0.05
JM91-211	Lower Lobes	NE of Squaw Ck	8995	18	17.0	6.9	13.89	0.11
JM91-204	Upper Lobes	NE of Squaw Ck	8986	15	21.0	2.1	13.90	0.05
JM92-303	Lower Lobes	Bat Spring	8990	15	16.5	2.4	13.95	0.06
JM92-322	Upper Rhyolite	Wes Hawkins	8997	15	15.2	4.0	14.09	0.10
JM92-297	NFork Xing	SE Top NFork Xing	8983	15	14.3	8.7	14.10	0.06
JM92-330	Swisher	Crutchers Xing	8985	14	16.0	5.1	14.15	0.11
JM92-295	Swisher	E of Jordan Valley	8984	15	15.4	9.3	14.21	0.13
JM92-298	NFork Xing	NW Top NFork Xing	8982	13	14.5	3.8	14.22	0.08
JM92-321	Lower Rhy	Wes Hawkins	8988	15	14.2	2.1	14.48	0.04
JM92-302*	Swisher	Deep Ck	8991	15	16.0	16.4	14.75	0.49
JM92-302*	Swisher	Deep Ck	8991	7	9.5	4.5	14.31	0.06

Notes: n is number of individual crystal analyzed by SCLF, K/Ca is molar ratio calculated from K-derived ^{39}Ar and Ca-derived ^{37}Ar. * indicates multigrain analysis; single-crystal analysis used for all other samples.

Methods:

Sample preparation: crushing, LST heavy liquid, Franz, HF **Irradiation:** one 7 hr irradiation package (NM-88), D-3 position, Nuclear Science Center, College Station, TX. **Neutron flux monitor:** sample FC-1 of interlaboratory standard Fish Canyon Tuff sanidine with an assigned age of 27.84 Ma (Deino and Potts, 1990), relative to Mmhb-1 at 520.4 Ma (Samson and Alexander, 1987); samples and monitors irradiated in alternating holes in machined Al discs.

Instrumentation: Mass Analyzer Products 215-50 mass spectrometer on line with automated, all-metal extraction system at New Mexico Geochronology Research Laboratory, Socorro. **Heating:** single-crystal laser-fusion, 10W continuous CO2 laser. **Reactive gas cleanup:** 1 to 2 minutes, SAES GP-50 getters operated at 20°C and ~450°C.

Mean and error calculation: Mean ages calculated using inverse variance weighting of Samson and Alexander (1987), all errors reported at ±2 sigma. **Decay constant and isotopic abundances:** Steiger and Jaeger (1977). **Complete data set:** McIntosh et al, 1998, NMBMMR Open File AR-4.

Analytical parameters: electron multiplier sensitivity = 7×10^{-17} moles/pA; average system blanks were 210, 3.2 , 0.4 , 1.5, 1.9×10^{-18} moles at masses 40, 39, 38, 37, 36 respectively. J-factors determined to a precision of ± 0.2% using CO_2 laser-fusion of 4 to 6 single crystals from each of 4 to 6 radial positions around irradiation vessel. Correction factors for interfering nuclear reactions, determined using K-glass and CaF_2 , $(^{40}Ar/^{39}Ar)_K = 0.00020 \pm 0.0003$; $(^{36}Ar/^{37}Ar)_{Ca} = 0.00026 \pm 0.00002$; and $(^{39}Ar/^{37}Ar)_{Ca} = 0.00070 \pm 0.00005$.

Table 1 Isotopic laser data.

Table 2. Laser-fusion $^{40}Ar/^{39}Ar$ analytical data.

ID	$^{40}Ar/^{39}Ar$	$^{37}Ar/^{39}Ar$	$^{36}Ar/^{39}Ar$ (x 10^{-3})	$^{39}Ar_K$ (x 10^{-15} mol)	K/Ca	$\%^{40}Ar^*$	Age (Ma)	±2σ (Ma)
JM92-328, A11:87, single crystal sanidine, J=0.000812103, D=1.0024, NM-87, Lab#=8992								
11	9.345	0.0209	0.0917	16.7	24.5	99.7	13.60	0.07
02	9.530	0.0202	0.7133	14.5	25.3	97.8	13.60	0.07
06	9.442	0.0215	0.4008	17.5	23.8	98.8	13.61	0.06
12	9.391	0.0211	0.2292	18.5	24.2	99.3	13.61	0.06
10	9.382	0.0279	0.1704	17.0	18.3	99.5	13.62	0.06
13	9.420	0.0200	0.2630	11.7	25.6	99.2	13.64	0.07
15	9.365	0.0217	0.0749	15.3	23.5	99.8	13.64	0.07
03	9.372	0.0199	0.0536	12.9	25.6	99.8	13.66	0.07
01	9.447	0.0224	0.2863	18.1	22.8	99.1	13.67	0.07
07	9.375	0.0199	0.0380	10.1	25.6	99.9	13.67	0.08
14	9.961	0.0244	2.017	21.6	20.9	94.0	13.67	0.07
04	9.509	0.0200	0.4763	8.66	25.6	98.5	13.68	0.10
09	9.505	0.0199	0.4363	15.2	25.6	98.7	13.69	0.07
08	9.502	0.0194	0.3748	11.3	26.3	98.8	13.71	0.07
05	9.727	0.0217	1.030	12.1	23.5	96.9	13.76	0.08
16	9.559	0.0189	0.4263	7.78	27.0	98.7	13.77	0.10
weighted mean ± S & A err		n=16			24.2 ±4.4		13.65	0.04
JM92-280, A8:8, single crystal sanidine, J=0.000812857, D=1.0024, NM-87, Lab#=8989								
12	9.841	0.0199	2.049	2.24	25.6	93.9	13.50	0.32
07	9.800	0.0185	1.906	1.59	27.6	94.3	13.50	0.44
09	9.127	0.0166	-0.5865	2.66	30.7	101.9	13.59	0.27
04	9.720	0.1301	1.415	2.84	3.9	95.8	13.61	0.26
08	9.755	0.0201	1.480	4.67	25.4	95.5	13.61	0.16
05	8.651	0.0190	-2.3067	1.04	26.8	107.9	13.64	0.66
10	9.655	0.0235	1.043	2.69	21.7	96.8	13.66	0.26
15	9.605	0.0244	0.8168	3.48	20.9	97.5	13.68	0.21
01	9.524	0.0196	0.4565	4.97	26.1	98.6	13.72	0.16
14	9.974	0.0203	1.940	2.09	25.1	94.3	13.74	0.33
06	9.617	0.0203	0.6983	2.69	25.2	97.9	13.75	0.26
11	10.07	0.0220	2.189	2.04	23.2	93.6	13.77	0.35
13	9.380	0.0188	-0.2330	2.60	27.1	100.7	13.81	0.27
02	10.57	0.0207	3.743	5.70	24.6	89.6	13.83	0.15
03	9.665	0.0182	0.6509	6.28	28.0	98.0	13.84	0.12
weighted mean ± S & A err		n=15			24.1 ±12.2		13.73	0.08
JM92-325, A12:87, single crystal sanidine, J=0.000811474, D=1.0024, NM-87, Lab#=8993								
13	9.892	0.0180	1.837	0.234	28.4	94.5	13.64	3.13
03	9.357	0.0168	-0.0076	0.313	30.4	100.0	13.65	2.08
10	9.477	0.0270	0.3080	1.87	18.9	99.1	13.69	0.37
14	9.566	0.0191	0.5206	1.05	26.7	98.4	13.73	0.73
01	9.999	0.0210	1.977	1.82	24.3	94.2	13.73	0.36
06	9.495	0.0222	0.2602	4.47	23.0	99.2	13.74	0.16
15	10.15	0.0196	2.451	0.176	26.0	92.9	13.75	4.43
11	9.707	0.0196	0.8539	0.680	26.0	97.4	13.79	1.04
12	9.545	0.0207	0.2378	2.71	24.6	99.3	13.82	0.27
08	9.577	0.0165	0.3392	0.556	30.9	99.0	13.82	1.21
02	10.41	0.0182	3.068	1.18	28.1	91.3	13.85	0.56

Table 1 Isotopic laser data.

ID	$^{40}Ar/^{39}Ar$	$^{37}Ar/^{39}Ar$	$^{36}Ar/^{39}Ar$ (x 10^{-3})	$^{39}Ar_K$ (x 10^{-15} mol)	K/Ca	$\%^{40}Ar^*$	Age (Ma)	±2σ (Ma)
04	9.513	0.0183	-0.1098	0.936	27.9	100.4	13.92	0.70

Table 1 Isotopic laser data.

ID	$^{40}Ar/^{39}Ar$	$^{37}Ar/^{39}Ar$	$^{36}Ar/^{39}Ar$ (x 10^{-3})	$^{39}Ar_K$ (x 10^{-15} mol)	K/Ca	$\%^{40}Ar^*$	Age (Ma)	±2σ (Ma)
05	9.549	0.0191	-0.0216	1.00	26.7	100.1	13.94	0.66
09	9.617	0.0170	-0.0675	0.377	30.1	100.2	14.05	1.80
07	9.938	0.0159	0.3827	0.293	32.1	98.9	14.33	2.28
weighted mean ± S & A err			n=15		26.9 ±6.8		13.77	0.12
JM91-252, A13:87, single crystal sanidine, J=0.000810432, D=1.0024, NM-87, Lab#=8994								
11	9.281	0.0197	-0.1940	1.52	25.9	100.6	13.60	0.43
02	10.09	0.0207	2.236	3.86	24.6	93.5	13.73	0.19
14	12.05	0.0194	8.857	3.03	26.4	78.3	13.74	0.27
07	13.70	0.0212	14.38	4.83	24.1	69.0	13.76	0.19
12	9.695	0.0191	0.8373	4.06	26.8	97.5	13.76	0.18
13	9.655	0.0208	0.6710	5.52	24.6	98.0	13.78	0.13
01	9.932	0.0197	1.597	5.03	26.0	95.3	13.78	0.15
04	9.804	0.0197	1.148	4.84	25.9	96.6	13.79	0.15
09	9.614	0.0195	0.4776	12.1	26.2	98.5	13.80	0.07
08	9.580	0.0215	0.3544	8.13	23.7	98.9	13.80	0.10
03	9.466	0.0204	-0.0402	5.83	25.0	100.1	13.81	0.12
05	10.07	0.0199	1.988	5.83	25.6	94.2	13.81	0.13
06	9.597	0.0188	0.3295	10.7	27.2	99.0	13.84	0.08
16	9.864	0.0218	1.215	5.05	23.4	96.4	13.85	0.14
10	9.606	0.0208	0.2247	9.40	24.5	99.3	13.90	0.09
15	9.564	0.0200	-0.0020	6.60	25.5	100.0	13.93	0.11
weighted mean ± S & A err			n=16		25.3 ±2.2		13.82	0.05
JM91-126, A15:87, single crystal sanidine, J=0.000809289, D=1.0024, NM-87, Lab#=8996								
11	10.59	0.0157	5.682	0.235	32.4	84.1	12.96	2.74
10	9.750	0.0150	1.112	1.82	34.1	96.6	13.70	0.37
09	9.827	0.0158	1.233	2.42	32.3	96.3	13.76	0.30
01	9.570	0.0156	0.3467	15.2	32.8	98.9	13.77	0.06
13	9.582	0.0159	0.3608	6.14	32.2	98.9	13.78	0.12
05	9.721	0.0151	0.7895	8.49	33.9	97.6	13.80	0.09
15	9.590	0.0157	0.3386	11.1	32.5	99.0	13.80	0.09
12	9.654	0.0168	0.4893	5.16	30.4	98.5	13.83	0.14
08	9.531	0.0163	0.0678	12.1	31.3	99.8	13.83	0.07
07	9.644	0.0162	0.4015	9.47	31.4	98.8	13.86	0.09
04	9.501	0.0158	-0.0999	2.64	32.3	100.3	13.86	0.26
06	9.613	0.0153	0.2786	14.3	33.4	99.2	13.86	0.07
03	18.39	0.0172	29.98	12.9	29.6	51.8	13.87	0.19
02	9.694	0.0152	0.5055	8.23	33.6	98.5	13.88	0.09
14	11.38	0.0164	6.049	3.68	31.1	84.3	13.95	0.23
weighted mean ± S & A err			n=15		32.2 ±2.5		13.83	0.04
JM92-316, A6:87, single crystal sanidine, J=0.000812048, D=1.0024, NM-87, Lab#=8987								
06	9.579	0.0195	0.5172	2.98	26.2	98.4	13.76	0.15
10	9.483	0.0203	0.1481	2.49	25.1	99.6	13.78	0.19
12	9.597	0.0177	0.5302	3.30	28.8	98.4	13.78	0.14
04	9.702	0.0164	0.8787	3.90	31.1	97.3	13.78	0.12
14	10.15	0.0206	2.240	7.19	24.7	93.5	13.85	0.07
09	9.965	0.0196	1.597	4.80	26.0	95.3	13.86	0.10
01	10.11	0.0180	2.084	10.6	28.3	93.9	13.86	0.07
02	9.670	0.0182	0.4995	6.63	28.0	98.5	13.90	0.08

Table 1 Isotopic laser data.

ID	$^{40}Ar/^{39}Ar$	$^{37}Ar/^{39}Ar$	$^{36}Ar/^{39}Ar$ (x 10^{-3})	$^{39}Ar_K$ (x 10^{-15} mol)	K/Ca	$\%^{40}Ar^*$	Age (Ma)	±2σ (Ma)
05	9.837	0.0188	1.059	1.73	27.2	96.8	13.90	0.23
03	10.64	0.0154	3.733	2.11	33.2	89.6	13.93	0.22
08	9.816	0.0185	0.8935	6.87	27.6	97.3	13.94	0.08
13	9.564	0.0192	0.0195	3.05	26.6	100.0	13.95	0.14
15	9.837	0.0174	0.9365	6.79	29.2	97.2	13.95	0.08
11	9.851	0.0169	0.9535	4.01	30.2	97.2	13.97	0.13
07	9.837	0.0183	0.8192	5.51	27.8	97.6	14.00	0.10
weighted mean ± S & A err			n=15		28.0 ±4.6		13.89	0.05
JM91-211, A14:87, single crystal sanidine, J=0.000809792, D=1.0024, NM-87, Lab#=8995								
14	11.76	0.0338	8.366	1.95	15.1	79.0	13.52	0.37
03	11.55	0.0174	7.390	0.883	29.3	81.1	13.63	0.76
06	10.06	0.0315	2.059	1.55	16.2	94.0	13.76	0.43
18	9.854	0.0249	1.285	2.18	20.5	96.2	13.79	0.32
01	9.638	0.0336	0.4931	5.15	15.2	98.5	13.82	0.14
05	9.749	0.0362	0.8267	1.75	14.1	97.5	13.84	0.38
07	9.517	0.0321	0.0098	1.80	15.9	100.0	13.85	0.36
15	9.490	0.0353	-0.1183	2.14	14.4	100.4	13.87	0.32
08	9.901	0.0323	1.178	1.93	15.8	96.5	13.91	0.34
11	9.496	0.0284	-0.2146	2.01	18.0	100.7	13.91	0.33
10	9.819	0.0349	0.8464	2.34	14.6	97.5	13.93	0.30
09	10.10	0.0349	1.778	0.933	14.6	94.8	13.94	0.71
02	9.951	0.0287	1.201	1.59	17.8	96.5	13.97	0.42
12	9.861	0.0310	0.8872	1.21	16.5	97.4	13.97	0.55
04	9.873	0.0302	0.6813	2.81	16.9	98.0	14.08	0.25
16	9.717	0.0308	0.0117	1.34	16.6	100.0	14.14	0.48
19	9.580	0.0307	-0.6038	1.48	16.6	101.9	14.20	0.45
17	10.65	0.0293	2.233	1.04	17.4	93.8	14.54	0.64
weighted mean ± S & A err			n=18		17.0 ±6.9		13.89	0.11
JM91-204, A5:87, single crystal sanidine, J=0.000811408, D=1.0024, NM-87, Lab#=8986								
06	9.464	0.0267	0.0776	15.6	19.1	99.8	13.77	0.06
12	9.464	0.0240	0.0624	15.6	21.2	99.8	13.78	0.06
02	9.548	0.0244	0.1750	10.1	20.9	99.5	13.85	0.06
13	9.535	0.0245	0.0648	9.02	20.8	99.8	13.88	0.06
14	9.559	0.0228	0.1443	7.70	22.4	99.6	13.88	0.07
11	9.675	0.0229	0.5350	15.2	22.3	98.4	13.88	0.06
05	9.567	0.0236	0.1673	12.9	21.7	99.5	13.88	0.05
09	9.563	0.0270	0.1355	16.3	18.9	99.6	13.89	0.06
04	9.584	0.0255	0.1415	13.4	20.0	99.6	13.92	0.05
08	9.571	0.0231	0.0954	9.19	22.1	99.7	13.92	0.06
07	9.637	0.0234	0.2798	12.8	21.8	99.2	13.93	0.06
15	9.684	0.0237	0.4276	13.4	21.5	98.7	13.94	0.06
01	9.628	0.0255	0.2281	6.68	20.0	99.3	13.94	0.08
03	9.612	0.0243	0.0893	16.0	21.0	99.7	13.98	0.06
10	9.638	0.0240	0.0619	12.5	21.3	99.8	14.03	0.05
weighted mean ± S & A err			n=15		21.0 ±2.1		13.90	0.05

Table 1 Isotopic laser data.

ID	$^{40}Ar/^{39}Ar$	$^{37}Ar/^{39}Ar$	$^{36}Ar/^{39}Ar$ (x 10^{-3})	$^{39}Ar_K$ (x 10^{-15} mol)	K/Ca	$\%^{40}Ar^*$	Age (Ma)	±2σ (Ma)
JM92-303, A9:87, single crystal sanidine, J=0.000812875, D=1.0024, NM-87, Lab#=8990								
13	9.945	0.0303	1.931	0.981	16.8	94.3	13.70	0.69
14	10.08	0.0282	2.382	1.87	18.1	93.0	13.71	0.37
10	10.41	0.0320	3.374	2.15	15.9	90.4	13.75	0.32
12	9.699	0.0270	0.8715	3.47	18.9	97.4	13.80	0.20
04	10.16	0.0319	2.416	2.79	16.0	93.0	13.81	0.26
03	9.906	0.0308	1.402	2.42	16.6	95.8	13.87	0.29
02	9.623	0.0289	0.3780	1.39	17.7	98.9	13.90	0.49
08	9.740	0.0301	0.7704	5.92	17.0	97.7	13.90	0.13
07	9.622	0.0332	0.3309	14.5	15.4	99.0	13.92	0.07
05	9.986	0.0325	1.441	6.65	15.7	95.8	13.97	0.12
06	9.550	0.0358	-0.0397	5.85	14.3	100.1	13.97	0.13
15	9.811	0.0291	0.7784	6.48	17.5	97.7	14.00	0.12
11	9.950	0.0321	1.202	5.95	15.9	96.5	14.02	0.13
09	10.05	0.0302	1.493	5.29	16.9	95.6	14.05	0.14
01	10.23	0.0327	1.792	2.20	15.6	94.8	14.17	0.32
weighted mean ± S & A err			n=15		16.5 ±2.4		13.95	0.06
JM92-322, A16:87, single crystal sanidine, J=0.000808983, D=1.0024, NM-87, Lab#=8997								
09	10.51	0.0344	3.325	2.44	14.9	90.7	13.85	0.30
01	9.856	0.0302	1.006	3.08	16.9	97.0	13.90	0.24
15	9.949	0.0281	1.243	2.11	18.1	96.3	13.93	0.32
11	10.06	0.0429	1.460	1.81	11.9	95.7	14.00	0.37
10	9.893	0.0303	0.8218	1.90	16.8	97.6	14.03	0.35
12	10.05	0.0351	1.276	1.91	14.5	96.3	14.06	0.35
08	10.22	0.0308	1.845	2.39	16.6	94.7	14.07	0.29
13	9.862	0.0402	0.5174	1.58	12.7	98.5	14.12	0.42
02	10.07	0.0415	1.227	2.92	12.3	96.4	14.12	0.24
07	10.06	0.0349	1.165	1.69	14.6	96.6	14.13	0.39
14	10.25	0.0318	1.797	4.51	16.0	94.8	14.13	0.16
03	10.70	0.0304	3.269	4.01	16.8	91.0	14.15	0.19
06	9.973	0.0303	0.5791	2.94	16.8	98.3	14.25	0.24
05	10.17	0.0404	1.128	1.24	12.6	96.8	14.31	0.53
04	11.26	0.0316	4.789	1.93	16.1	87.5	14.32	0.36
weighted mean ± S & A err			n=15		15.2 ±4.0		14.09	0.10
JM92-297, A2:87, single crystal sanidine, J=0.00080925, D=1.0024, NM-87, Lab#=8983								
14	9.640	0.0378	0.3778	2.44	13.5	98.9	13.86	0.18
12	9.715	0.0306	0.2565	3.86	16.7	99.2	14.02	0.11
02	9.667	0.0350	0.0928	1.01	14.6	99.7	14.02	0.35
15	9.734	0.0338	0.3123	2.83	15.1	99.1	14.03	0.15
09	9.748	0.0379	0.2424	3.31	13.5	99.3	14.08	0.14
10	9.720	0.0282	0.1357	5.01	18.1	99.6	14.08	0.09
13	9.720	0.0384	0.1041	3.14	13.3	99.7	14.10	0.15
04	9.730	0.0345	0.1275	2.85	14.8	99.6	14.10	0.14
11	9.751	0.0387	0.1487	4.03	13.2	99.6	14.12	0.11
01	9.780	0.0362	0.2315	0.774	14.1	99.3	14.13	0.47
06	9.669	0.0265	-0.1581	1.43	19.3	100.5	14.13	0.26
08	9.812	0.0283	0.1948	7.03	18.0	99.4	14.19	0.08
07	9.791	0.0398	-0.3928	0.791	12.8	101.2	14.41	0.46

Table 1 Isotopic laser data.

ID	$^{40}Ar/^{39}Ar$	$^{37}Ar/^{39}Ar$	$^{36}Ar/^{39}Ar$ (x 10^{-3})	$^{39}Ar_K$ (x 10^{-15} mol)	K/Ca	%^{40}Ar*	Age (Ma)	±2σ (Ma)
05	9.810	0.0304	-0.6841	0.503	16.8	102.1	14.56	0.72
03	9.585	1.823	-1.5658	0.136	0.28	106.3	14.83	2.53
weighted mean ± S & A err			n=15		14.3 ±8.7		14.10	0.06
JM92-330, A4:87, single crystal sanidine, J=0.000810366, D=1.0024, NM-87, Lab#=8985								
06	9.967	0.0320	1.415	1.99	15.9	95.8	13.91	0.21
05	9.883	0.0333	0.8774	1.82	15.3	97.4	14.02	0.21
04	9.667	0.0418	0.0737	2.27	12.2	99.8	14.05	0.19
02	9.800	0.0246	0.5189	1.85	20.7	98.5	14.05	0.21
03	10.08	0.0375	1.263	1.79	13.6	96.3	14.13	0.23
07	9.855	0.0299	0.4651	1.20	17.1	98.6	14.15	0.31
16	9.815	0.0332	0.2848	2.06	15.3	99.2	14.17	0.18
12	9.631	0.0359	-0.3437	1.26	14.2	101.1	14.18	0.29
08	9.723	0.0283	-0.1251	1.33	18.0	100.4	14.22	0.28
11	10.11	0.0400	1.127	0.828	12.8	96.7	14.24	0.45
14	9.765	0.0340	-0.0540	1.28	15.0	100.2	14.25	0.30
01	9.860	0.0303	0.0759	1.50	16.8	99.8	14.33	0.26
09	9.844	0.0250	-0.0286	0.824	20.4	100.1	14.35	0.43
13	9.870	0.0298	-0.4700	1.49	17.1	101.4	14.58	0.25
15	*9.860*	*0.1793*	*-1.2582*	*1.19*	*2.8*	*103.9*	*14.92*	*0.32*
weighted mean ± S & A err			n=14		16.0 ±5.1		14.15	0.11
JM92-295, A3:87, single crystal sanidine, J=0.000809737, D=1.0024, NM-87, Lab#=8984								
14	11.56	0.0247	7.135	0.670	20.7	81.8	13.76	0.58
03	9.540	0.0309	-0.2138	0.777	16.5	100.7	13.98	0.48
15	9.719	0.0383	0.2031	0.819	13.3	99.4	14.06	0.45
08	9.861	0.0328	0.4981	1.12	15.5	98.5	14.14	0.33
02	9.786	0.0349	0.2113	2.51	14.6	99.4	14.15	0.16
09	9.790	0.0331	0.1256	0.588	15.4	99.6	14.19	0.60
05	9.753	0.0266	-0.0641	0.946	19.2	100.2	14.22	0.39
12	9.904	0.0263	0.4368	0.517	19.4	98.7	14.23	0.71
06	10.06	0.4264	0.9532	0.448	1.2	97.5	14.29	0.82
04	9.810	0.0361	-0.0696	0.997	14.1	100.2	14.31	0.37
07	9.730	0.0276	-0.4605	1.15	18.5	101.4	14.36	0.32
11	9.722	0.0378	-0.5616	0.658	13.5	101.7	14.39	0.54
10	10.29	0.0388	1.318	0.527	13.1	96.2	14.41	0.71
01	9.899	0.0265	-0.0847	0.730	19.3	100.3	14.44	0.50
13	9.793	0.0312	-1.0565	0.677	16.4	103.2	14.71	0.54
weighted mean ± S & A err			n=15		15.4 ±9.3		14.21	0.13
JM92-298, A1:87, single crystal sanidine, J=0.000808965, D=1.0024, NM-87, Lab#=8982								
03	9.737	0.0395	0.2002	2.74	12.9	99.4	14.07	0.16
05	9.606	0.0310	-0.3249	1.33	16.4	101.0	14.11	0.28
08	9.805	0.0350	0.2476	1.05	14.6	99.3	14.15	0.37
01	9.733	0.0366	-0.0274	1.83	13.9	100.1	14.16	0.23
02	9.777	0.0354	0.1079	3.06	14.4	99.7	14.17	0.16
09	9.741	0.0347	-0.1019	2.54	14.7	100.3	14.21	0.17
11	9.832	0.0389	0.1835	2.54	13.1	99.5	14.22	0.17
14	9.786	0.0394	-0.0485	1.27	13.0	100.2	14.25	0.29
15	9.790	0.0370	-0.0655	4.27	13.8	100.2	14.26	0.11
12	9.771	0.0264	-0.2793	1.49	19.3	100.9	14.33	0.26

Table 1 Isotopic laser data.

ID	$^{40}Ar/^{39}Ar$	$^{37}Ar/^{39}Ar$	$^{36}Ar/^{39}Ar$ (x 10^{-3})	$^{39}Ar_K$ (x 10^{-15} mol)	K/Ca	$\%^{40}Ar^*$	Age (Ma)	±2σ (Ma)
04	9.901	0.0388	0.1129	1.03	13.1	99.7	14.35	0.38
10	9.651	0.0318	-0.8167	0.637	16.1	102.5	14.38	0.56
13	9.867	0.0406	-0.0917	1.47	12.6	100.3	14.39	0.26
06	*10.59*	*0.0405*	*-0.9707*	*0.196*	*12.6*	*102.7*	*15.81*	*1.90*
weighted mean ± S & A err		n=13			14.5 ±3.8		14.22	0.08
JM92-321, A7:87, single crystal sanidine, J=0.000812551, D=1.0024, NM-87, Lab#=8988								
14	9.884	0.0355	0.1083	17.0	14.4	99.7	14.39	0.06
12	9.919	0.0340	0.1407	7.26	15.0	99.6	14.43	0.08
10	9.905	0.0327	0.0789	7.41	15.6	99.8	14.43	0.07
01	9.944	0.0337	0.1852	22.3	15.1	99.5	14.44	0.06
15	10.08	0.0381	0.6270	9.32	13.4	98.2	14.44	0.07
11	9.996	0.0421	0.3327	3.43	12.1	99.0	14.46	0.14
05	10.02	0.0343	0.3928	10.5	14.9	98.9	14.46	0.07
16	9.958	0.0366	0.1856	9.54	14.0	99.5	14.46	0.07
04	10.01	0.0364	0.3303	14.5	14.0	99.1	14.48	0.06
06	9.973	0.0362	0.1658	13.7	14.1	99.5	14.49	0.06
07	9.954	0.0366	0.0990	14.0	14.0	99.7	14.49	0.05
13	10.05	0.0335	0.2868	6.40	15.3	99.2	14.55	0.08
02	10.10	0.0339	0.4567	12.8	15.1	98.7	14.55	0.06
08	10.04	0.0420	0.2618	8.39	12.1	99.3	14.55	0.07
03	10.12	0.0373	0.4462	8.68	13.7	98.7	14.59	0.06
09	*10.07*	*0.0388*	*-1.6381*	*0.357*	*13.1*	*104.8*	*15.40*	*1.08*
weighted mean ± S & A err		n=15			14.2 ±2.1		14.48	0.04
JM92-302, A10:87, single crystal sanidine, J=0.00081259, D=1.0024, NM-87, Lab#=8991								
02	9.600	0.0291	0.0365	0.220	17.5	99.9	14.01	3.01
09	9.984	0.0235	0.9738	0.290	21.7	97.1	14.16	2.27
01	9.845	0.0245	0.1653	0.418	20.8	99.5	14.31	1.58
03	9.909	0.0267	-0.2635	0.464	19.1	100.8	14.58	1.43
13	10.14	0.0271	0.4838	0.815	18.9	98.6	14.59	0.80
12	10.00	0.0296	-0.2193	0.452	17.3	100.7	14.70	1.45
14	9.883	0.0268	-0.6422	0.428	19.1	101.9	14.71	1.52
05	10.08	0.0235	-0.1821	0.341	21.7	100.5	14.80	1.94
06	32.77	0.0342	75.96	0.783	14.9	31.5	15.08	0.98
11	9.581	0.0247	-3.0537	0.183	20.6	109.4	15.31	3.58
04	8.503	1.819	-6.2261	0.054	0.28	123.3	15.32	12.26
08	9.846	0.2912	-2.3179	0.146	1.8	107.2	15.41	4.51
07	34.97	0.0217	81.64	0.243	23.5	31.0	15.83	2.88
10	32.61	0.0221	72.19	0.188	23.0	34.6	16.45	3.64
15	12.91	1.754	-4.3496	0.032	0.29	111.0	20.91	20.60
weighted mean ± S & A err		n=15			16.0 ±16.4		14.75	0.49
JM92-302, A10:87, multiple crystals sanidine, J=0.00081259, D=1.0008, NM-87, Lab#=8991								
22	*9.870*	*0.0325*	*0.6325*	*1.68*	*15.7*	*98.1*	*14.14*	*0.12*
20	9.933	0.0771	0.6431	1.82	6.6	98.1	14.24	0.09
26	9.924	0.0749	0.5970	2.81	6.8	98.3	14.24	0.09
24	9.983	0.0532	0.6684	3.49	9.6	98.1	14.29	0.07
28	9.977	0.0493	0.5777	2.94	10.3	98.3	14.32	0.07
23	10.01	0.0458	0.6359	3.69	11.1	98.2	14.35	0.08
25	10.05	0.0395	0.6787	1.44	12.9	98.0	14.38	0.10

Table 1 Isotopic laser data.

ID	$^{40}Ar/^{39}Ar$	$^{37}Ar/^{39}Ar$	$^{36}Ar/^{39}Ar$ (x 10^{-3})	$^{39}Ar_K$ (x 10^{-15} mol)	K/Ca	$\%^{40}Ar^*$	Age (Ma)	±2σ (Ma)
21	10.04	0.0572	0.6080	1.43	8.9	98.3	14.40	0.11
27	*9.989*	*0.0421*	*-0.1867*	*0.832*	*12.1*	*100.6*	*14.67*	*0.13*
weighted mean ± S & A err			n=7		9.5 ±4.5		14.31	0.06

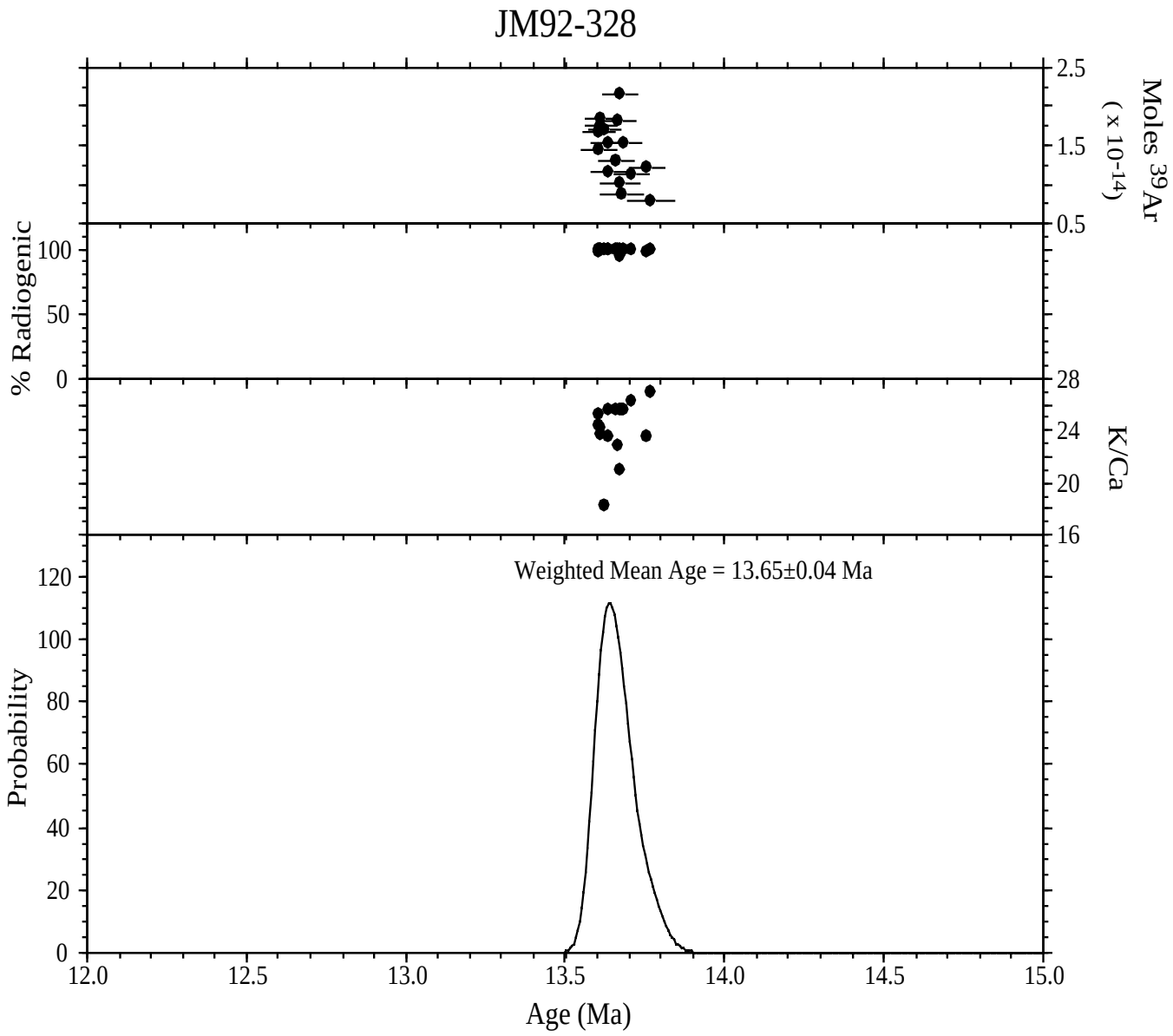
Isotopic ratios corrected for blank, radioactive decay, and mass discrimination, not corrected for interferring reactions.
Individual analyses show analytical error only; mean age errors also include error in J and irradiation parameters.
Analyses in italics are excluded excluded from mean age calculations.
Correction factors:

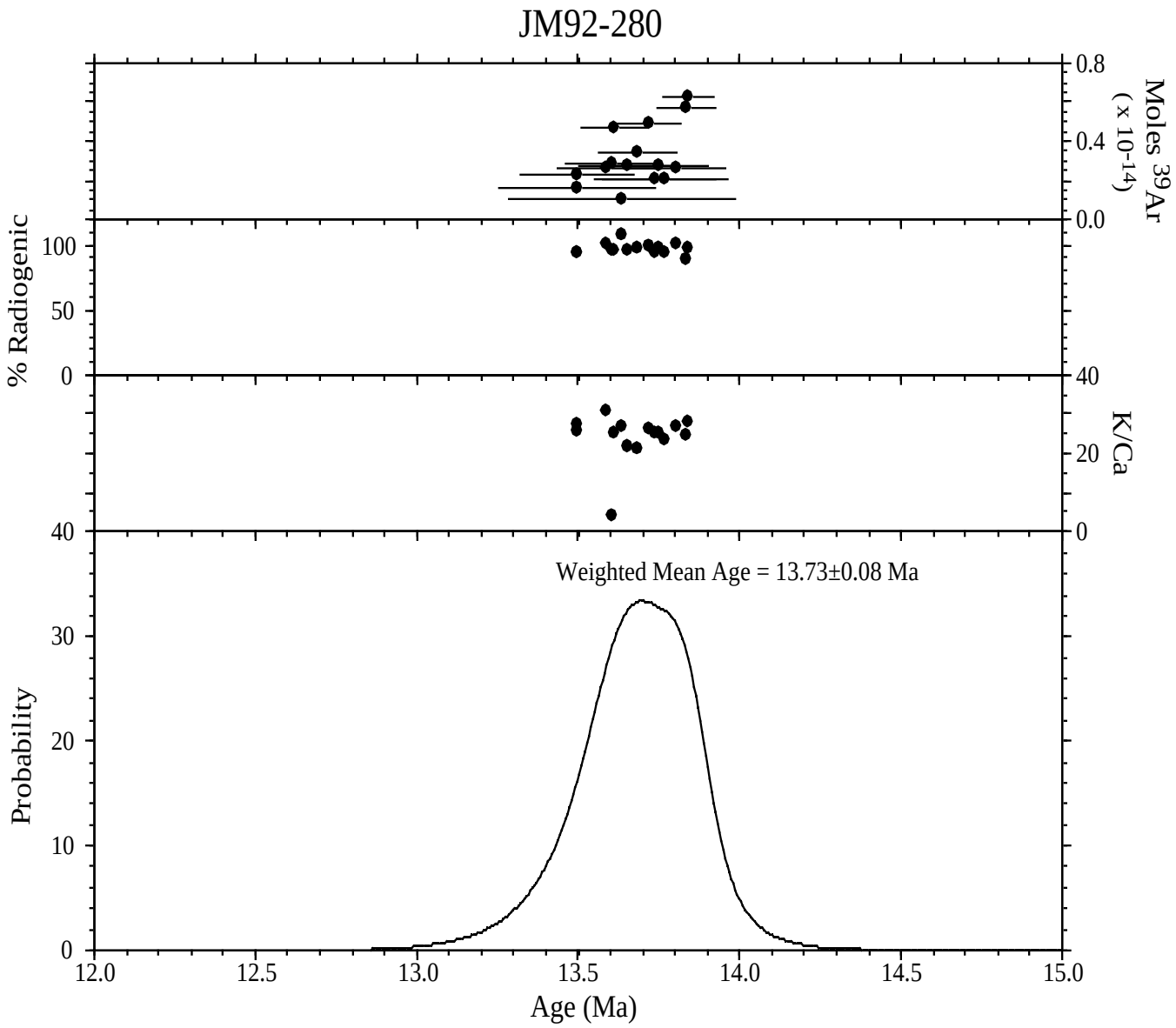
$(^{39}Ar/^{37}Ar)_{Ca}$ = 0.00070±0.00005

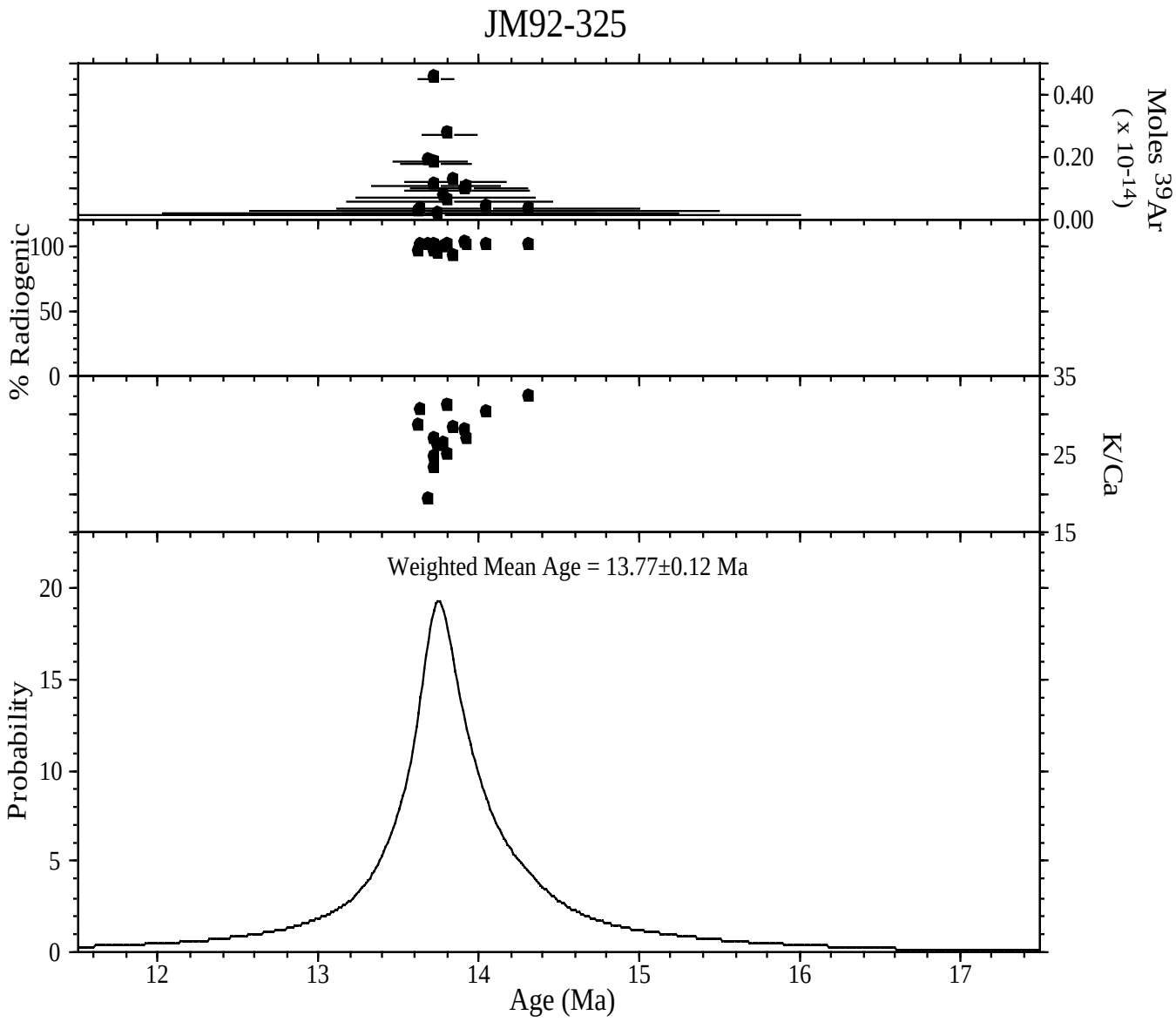
$(^{36}Ar/^{37}Ar)_{Ca}$ = 0.00026±0.00002

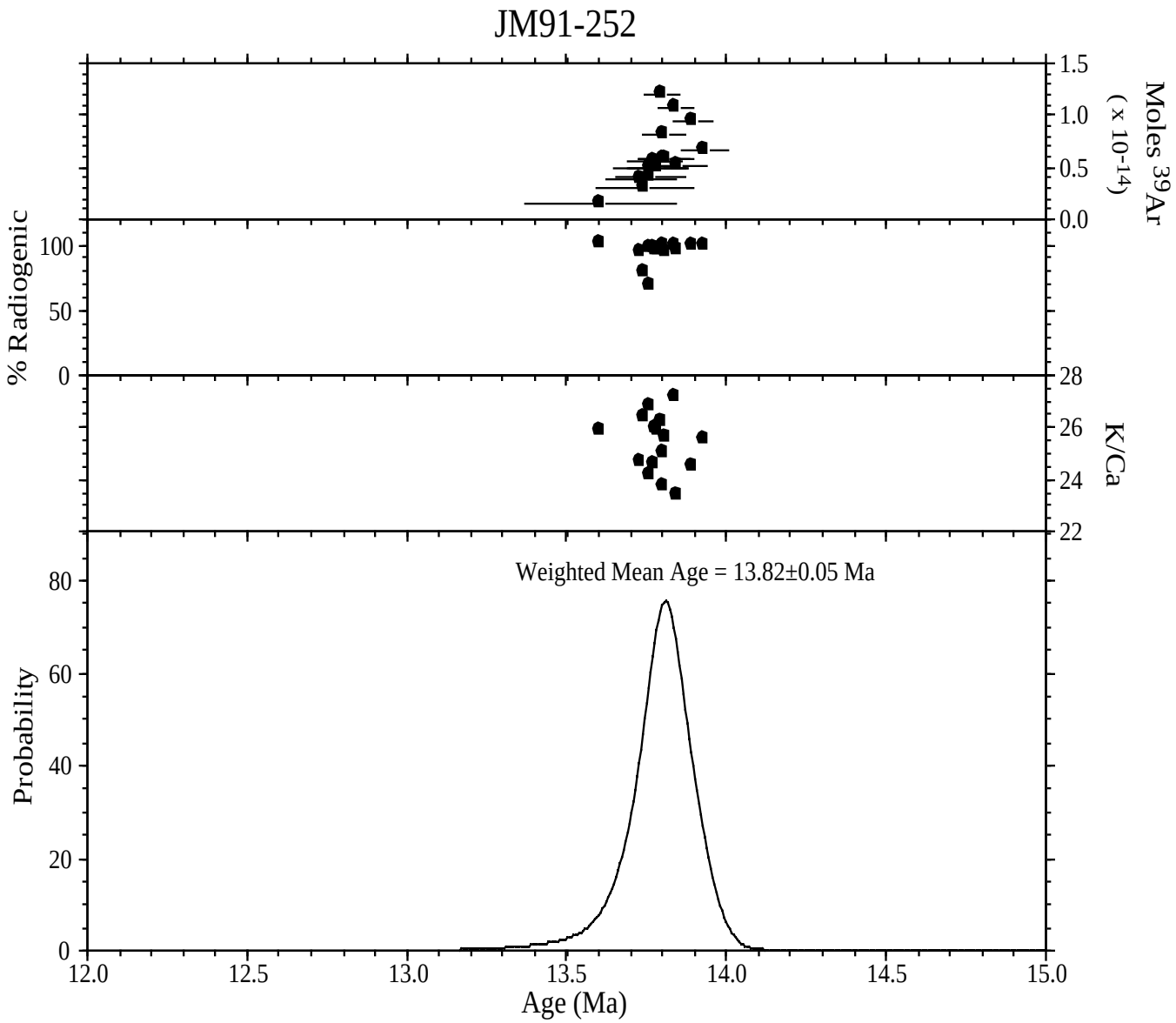
$(^{38}Ar/^{39}Ar)_{K}$ = 0.0119

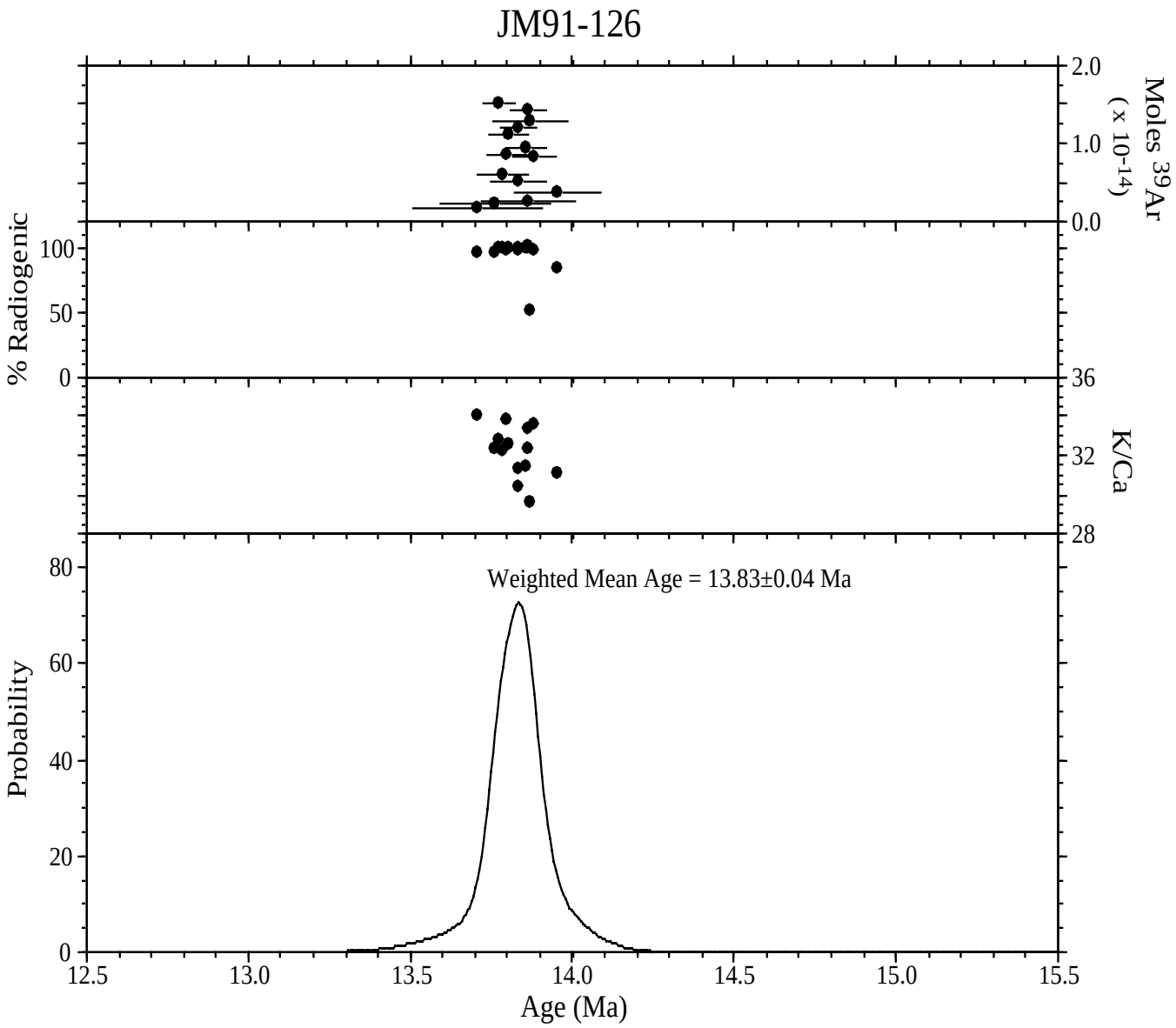
$(^{40}Ar/^{39}Ar)_{K}$ = 0.0002±0.0003

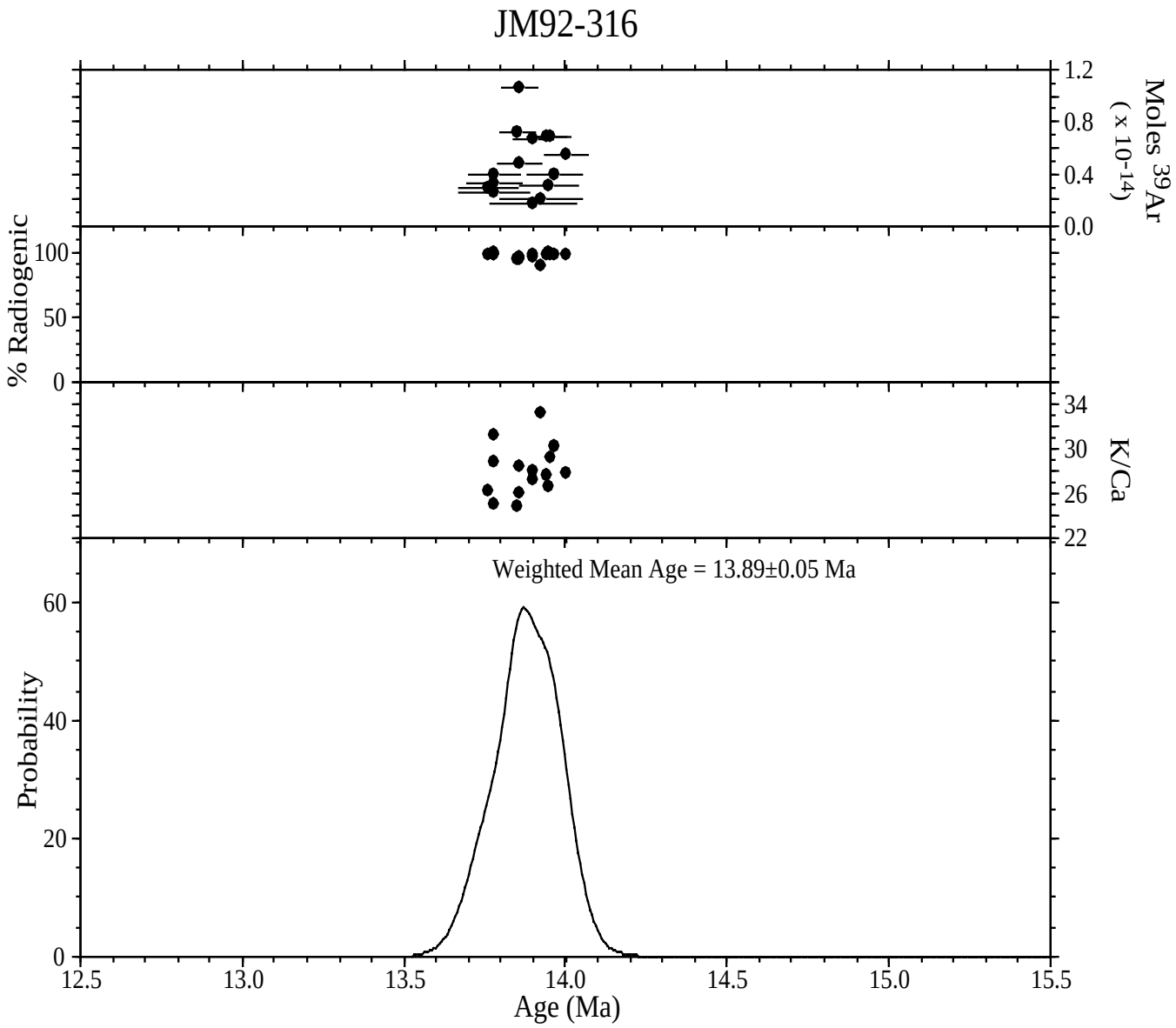

JM92-328
Moles 39Ar (x 10-14)
2.5
1.5
0.5
% Radiogenic
100
50
0
28
24
20
16
K/Ca
Weighted Mean Age = 13.65±0.04 Ma
Probability
120
100
80
60
40
20
0
12.0
12.5
13.0
13.5
14.0
14.5
15.0
Age (Ma)

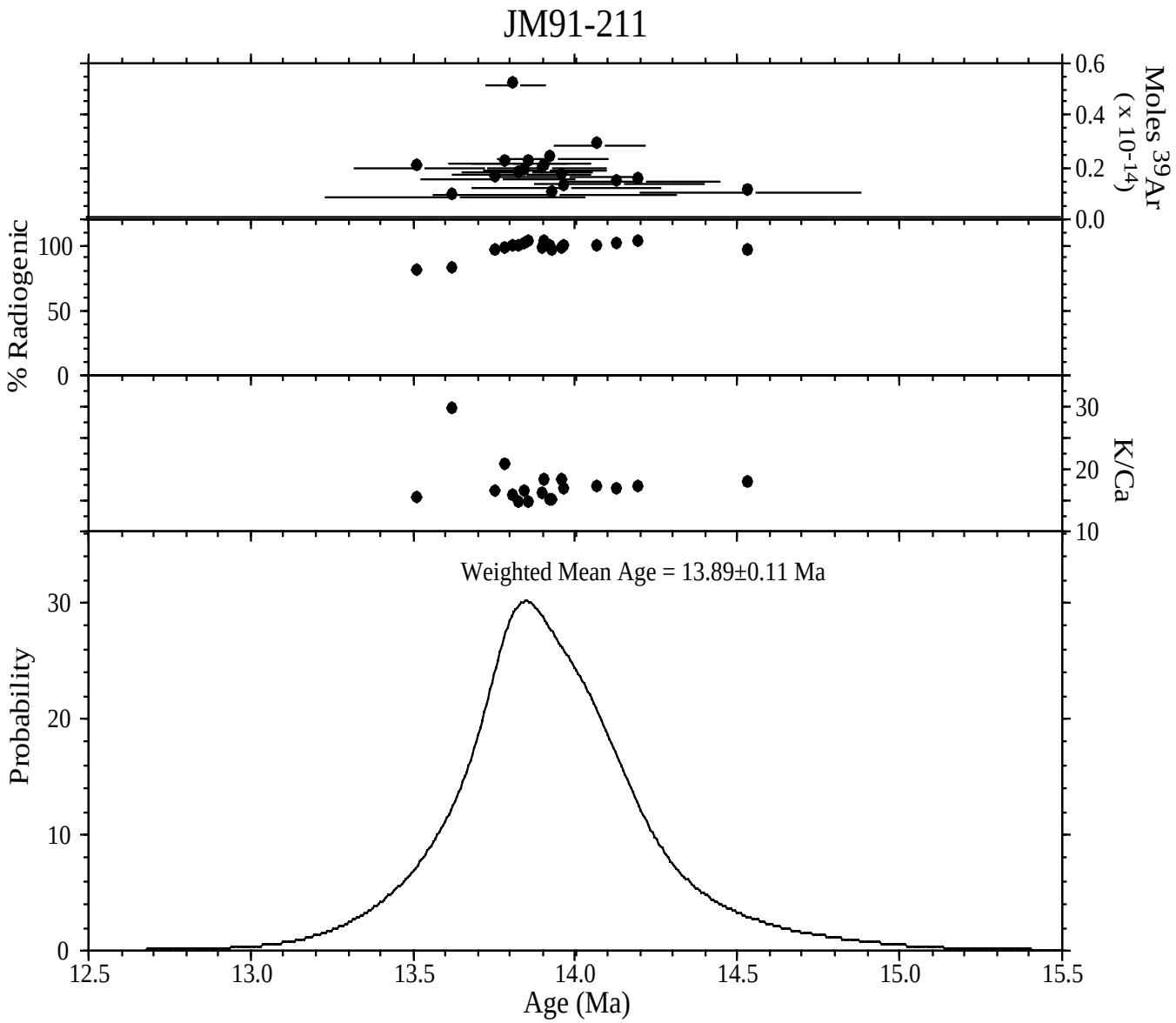

JM92-280
Moles 39Ar (x 10-14)
0.8
0.4
0.0
% Radiogenic
100
50
0
K/Ca
40
20
0
Weighted Mean Age = 13.73±0.08 Ma
Probability
30
20
10
0
12.0
12.5
13.0
13.5
14.0
14.5
15.0
Age (Ma)

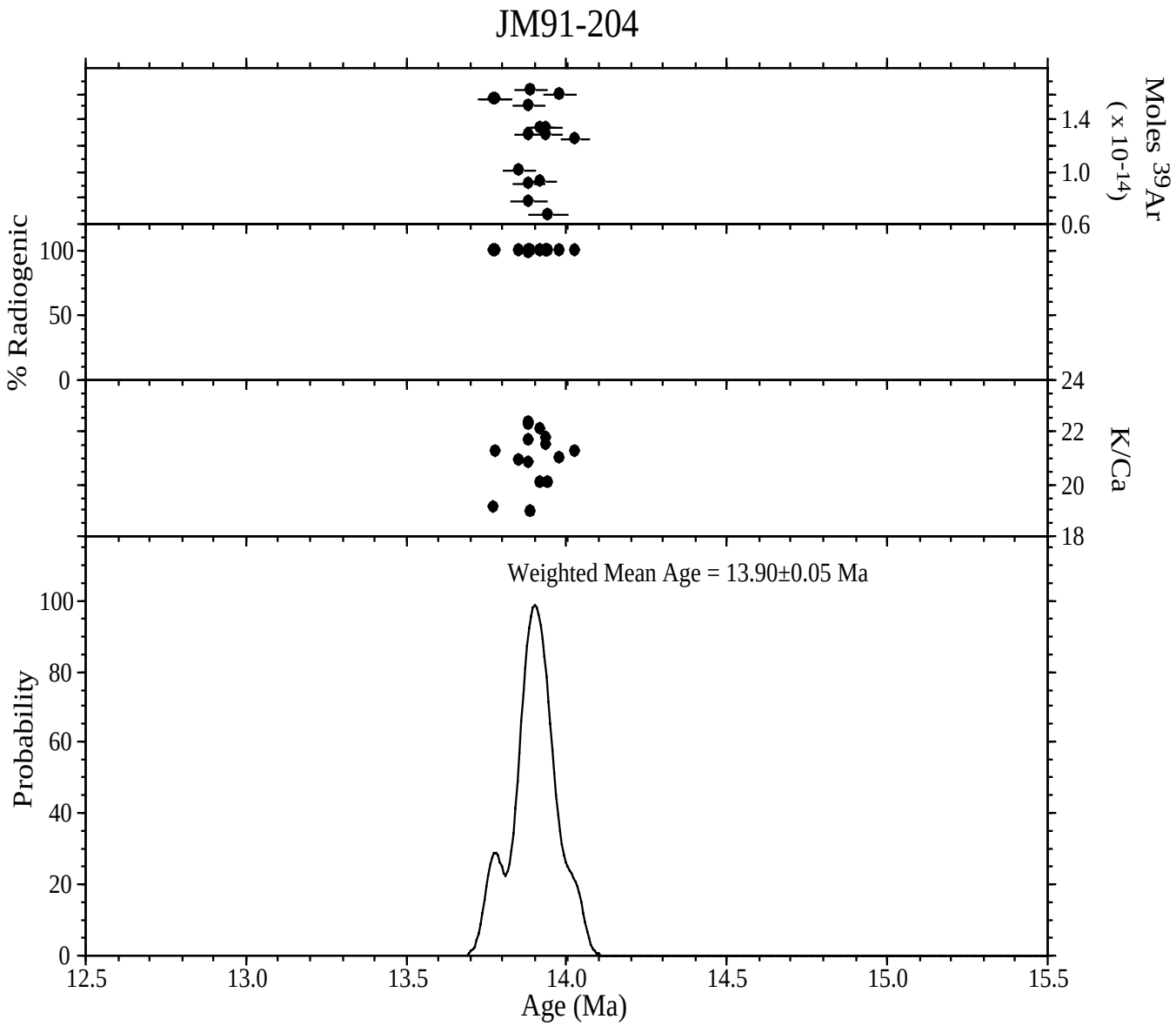

JM92-325
Moles 39Ar (x 10-14)
0.40
0.20
0.00
% Radiogenic
100
50
0
K/Ca
35
25
15
Weighted Mean Age = 13.77±0.12 Ma
Probability
20
15
10
5
0
12
13
14
15
16
17
Age (Ma)

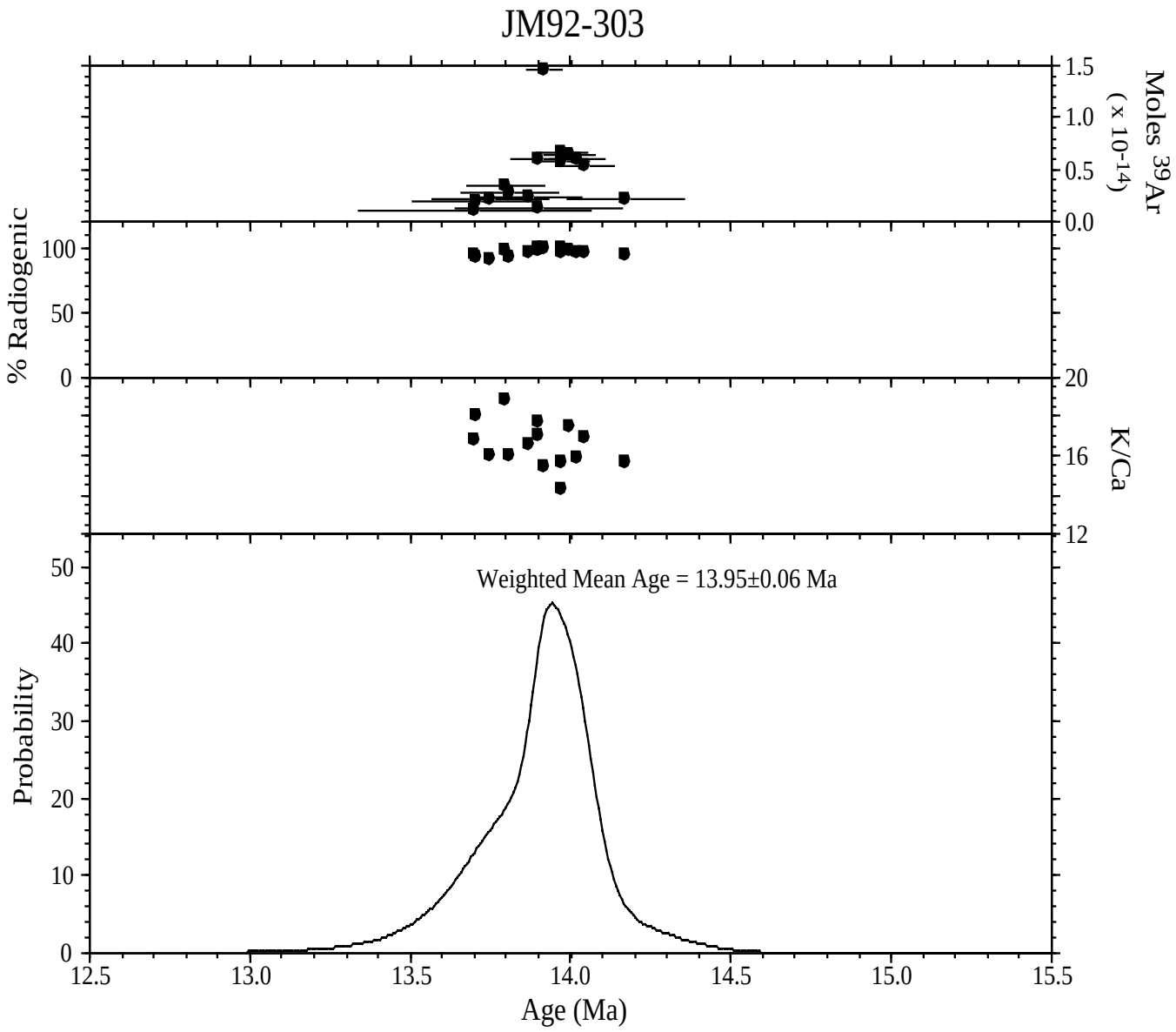

JM91-252
Moles 39Ar
(x 10-14)
1.5
1.0
0.5
0.0
% Radiogenic
100
50
0
28
26
24
22
K/Ca
Weighted Mean Age = 13.82±0.05 Ma
Probability
80
60
40
20
0
12.0
12.5
13.0
13.5
14.0
14.5
15.0
Age (Ma)

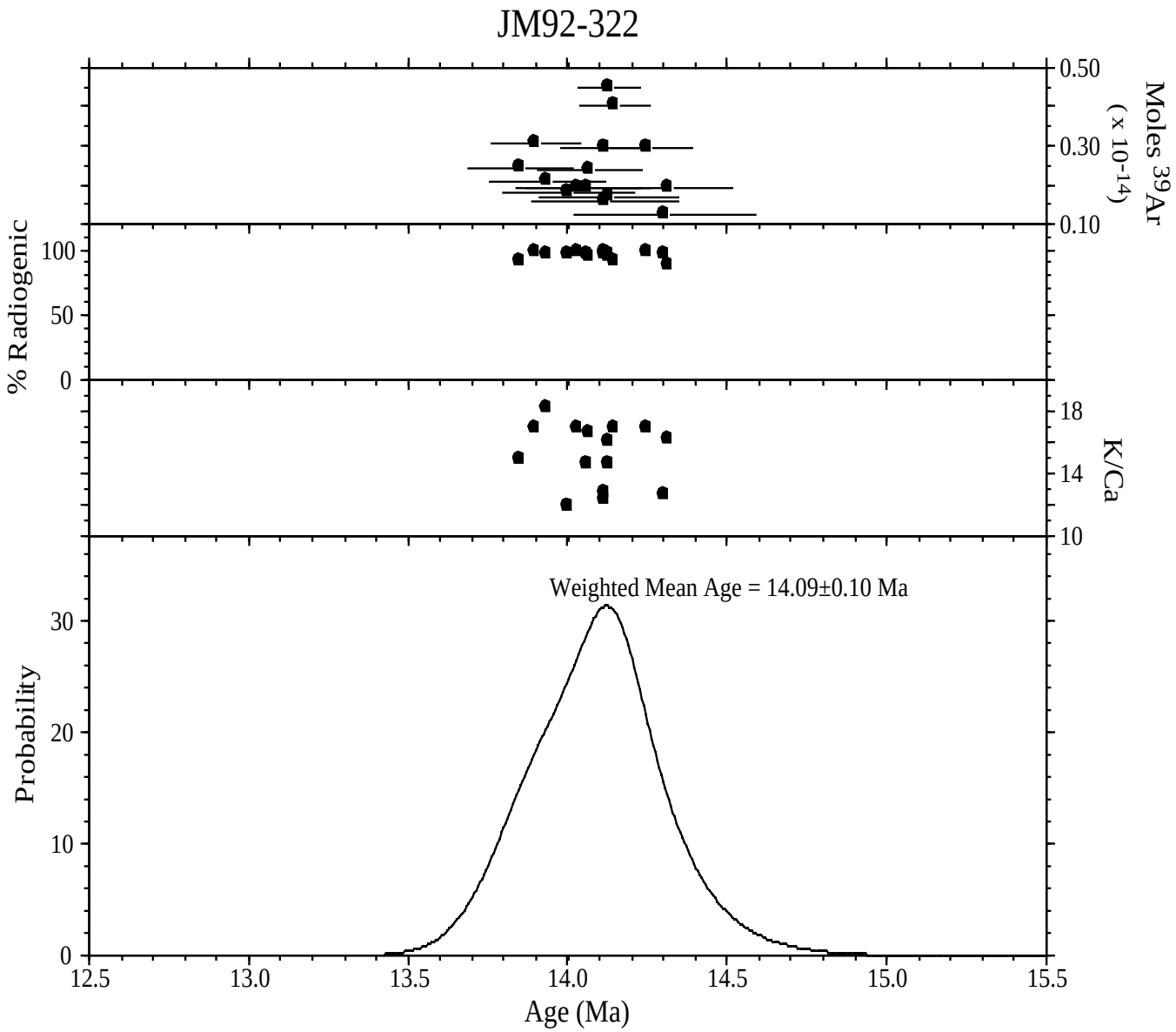

JM91-126
Moles ^{39}Ar (x 10^{-14})
2.0
1.0
0.0
% Radiogenic
100
50
0
36
32
28
K/Ca
Weighted Mean Age = 13.83±0.04 Ma
Probability
80
60
40
20
0
12.5
13.0
13.5
14.0
14.5
15.0
15.5
Age (Ma)

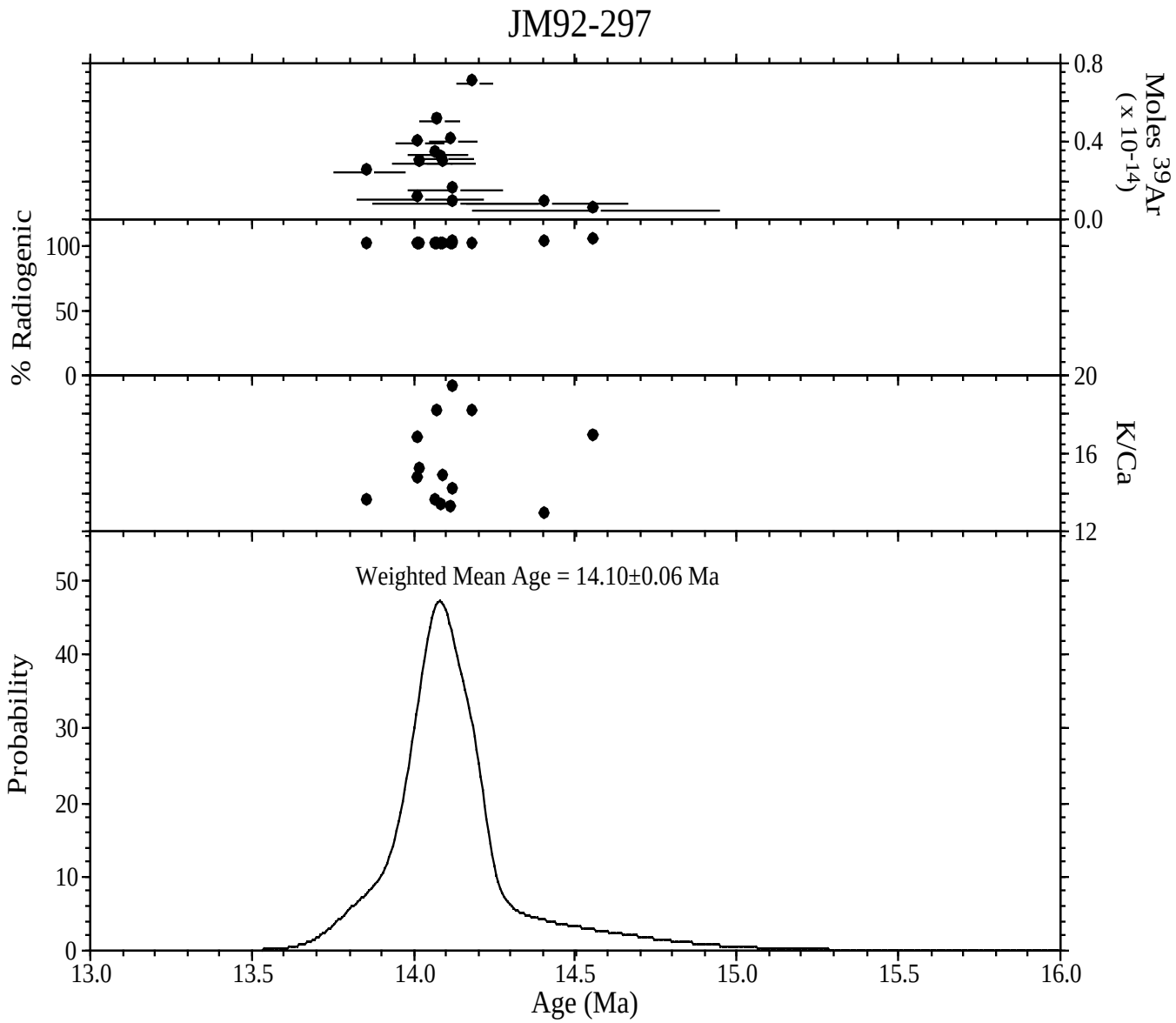

JM92-316
Moles 39Ar (x 10-14)
1.2
0.8
0.4
0.0
% Radiogenic
100
50
0
K/Ca
34
30
26
22
Weighted Mean Age = 13.89±0.05 Ma
Probability
60
40
20
0
12.5
13.0
13.5
14.0
14.5
15.0
15.5
Age (Ma)

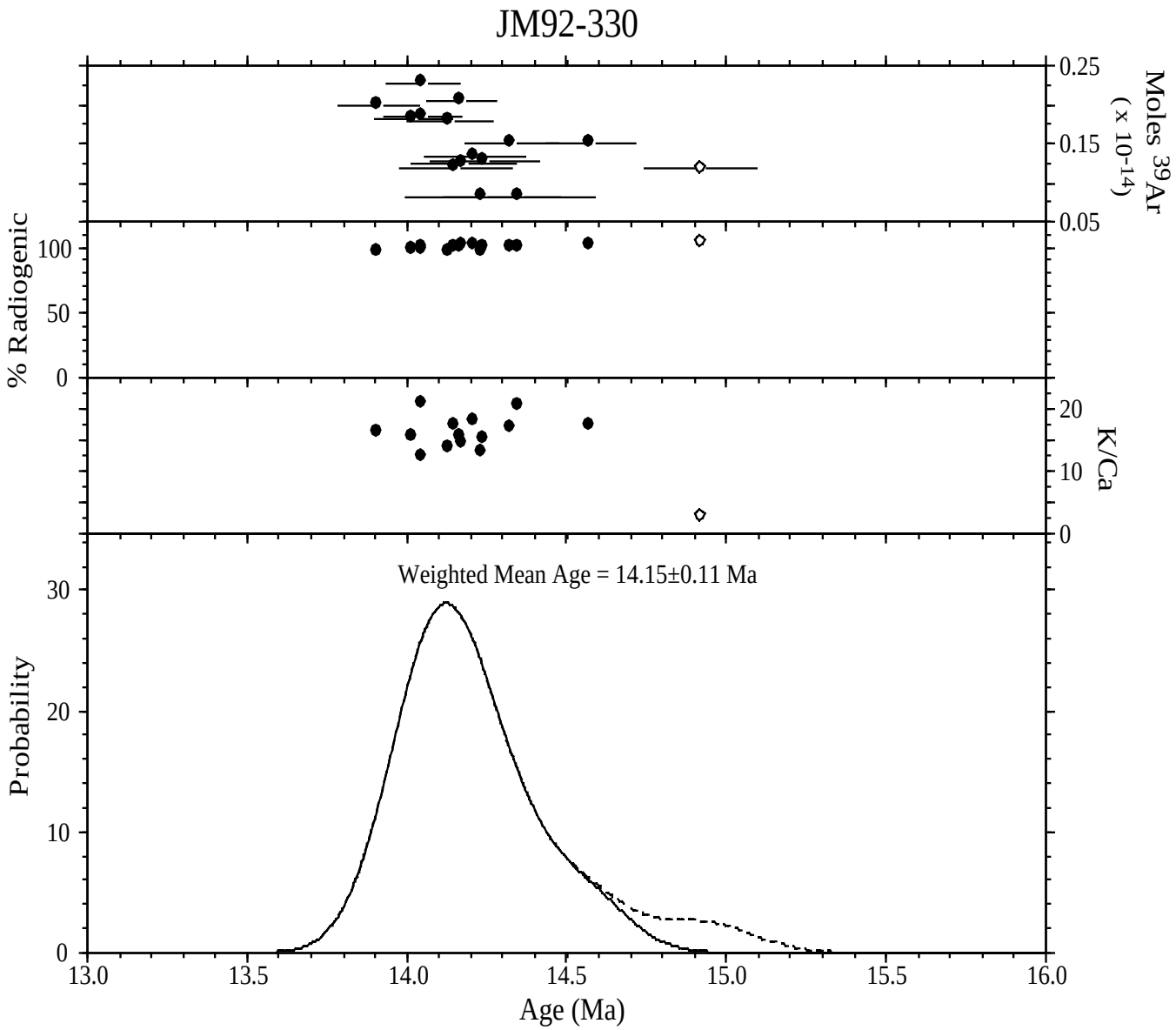

JM91-211
Moles 39Ar (x 10-14)
0.6
0.4
0.2
0.0
% Radiogenic
100
50
0
K/Ca
30
20
10
Weighted Mean Age = 13.89±0.11 Ma
Probability
30
20
10
0
12.5
13.0
13.5
14.0
14.5
15.0
15.5
Age (Ma)

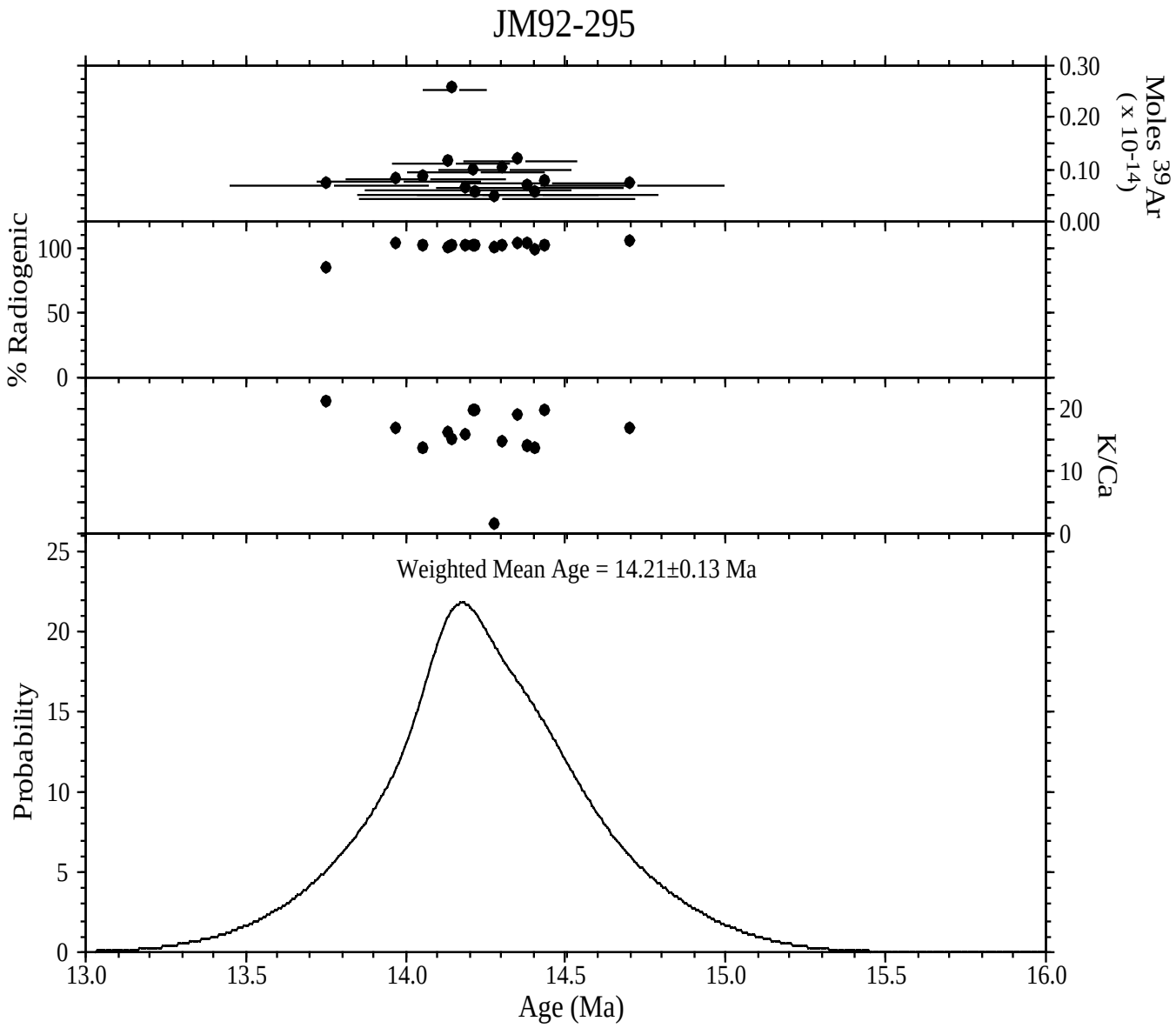

JM91-204
Moles ^{39}Ar (x 10^{-14})
1.4
1.0
0.6
% Radiogenic
100
50
0
K/Ca
24
22
20
18
Weighted Mean Age = 13.90±0.05 Ma
Probability
100
80
60
40
20
0
12.5
13.0
13.5
14.0
14.5
15.0
15.5
Age (Ma)

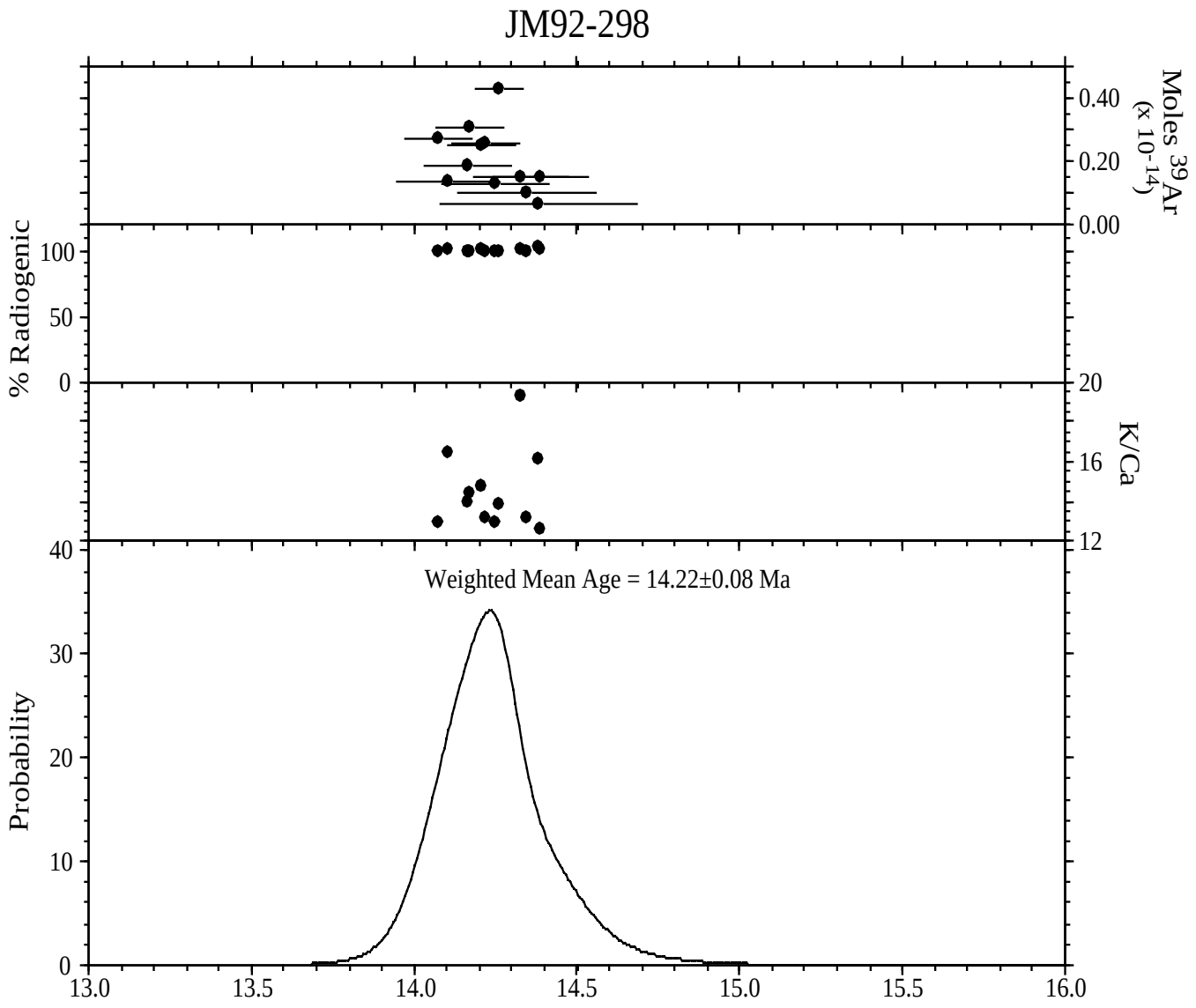

JM92-303
Moles 39Ar (x 10-14)
1.5
1.0
0.5
0.0
% Radiogenic
100
50
0
K/Ca
20
16
12
Weighted Mean Age = 13.95±0.06 Ma
Probability
50
40
30
20
10
0
12.5
13.0
13.5
14.0
14.5
15.0
15.5
Age (Ma)

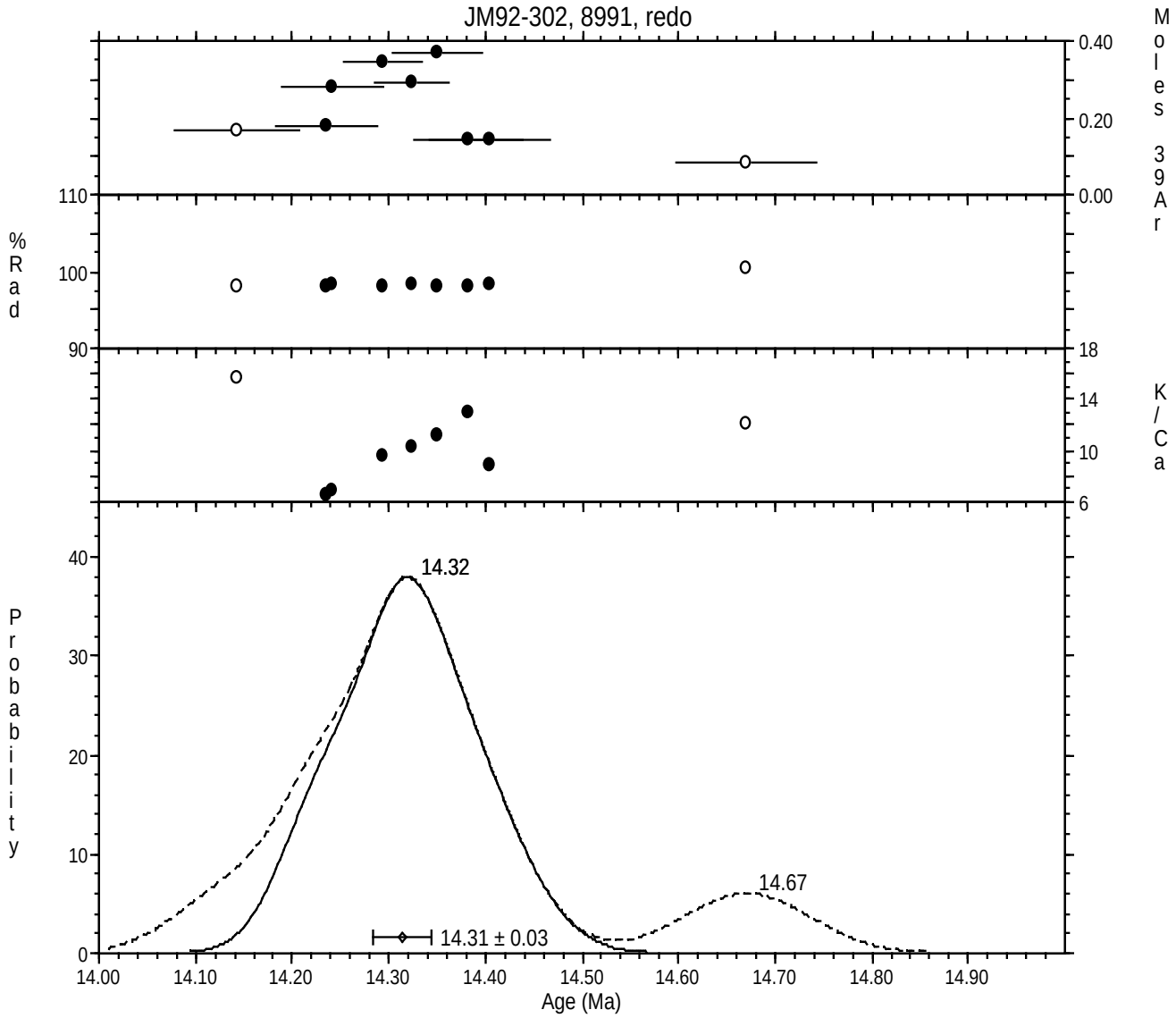

JM92-322
Moles 39Ar (x 10-14)
0.50
0.30
0.10
% Radiogenic
100
50
0
K/Ca
18
14
10
Weighted Mean Age = 14.09±0.10 Ma
Probability
30
20
10
0
12.5
13.0
13.5
14.0
14.5
15.0
15.5
Age (Ma)

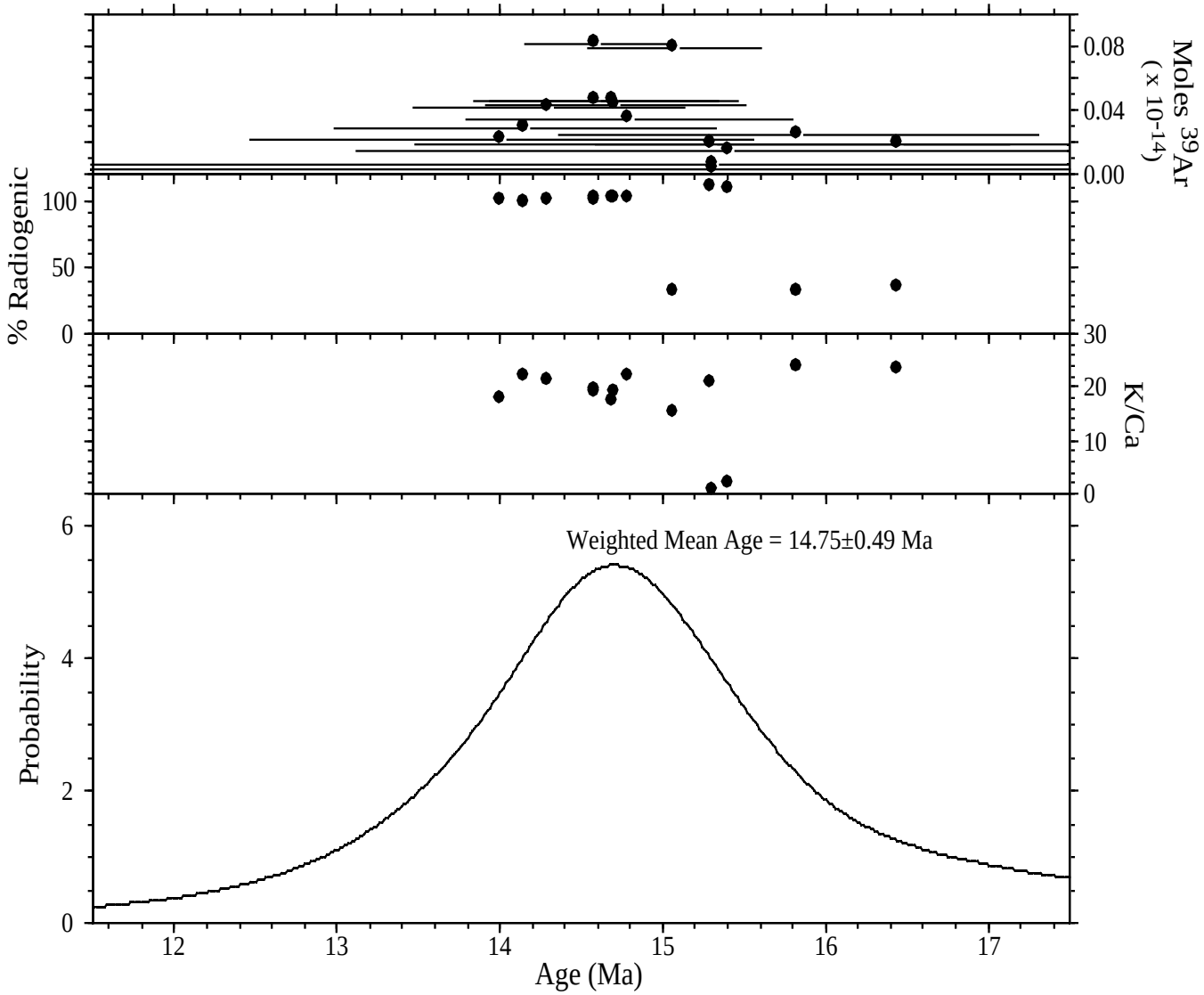

JM92-297
Moles 39Ar (x 10-14)
0.8
0.4
0.0
% Radiogenic
100
50
0
20
16
12
K/Ca
Weighted Mean Age = 14.10±0.06 Ma
Probability
50
40
30
20
10
0
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Age (Ma)

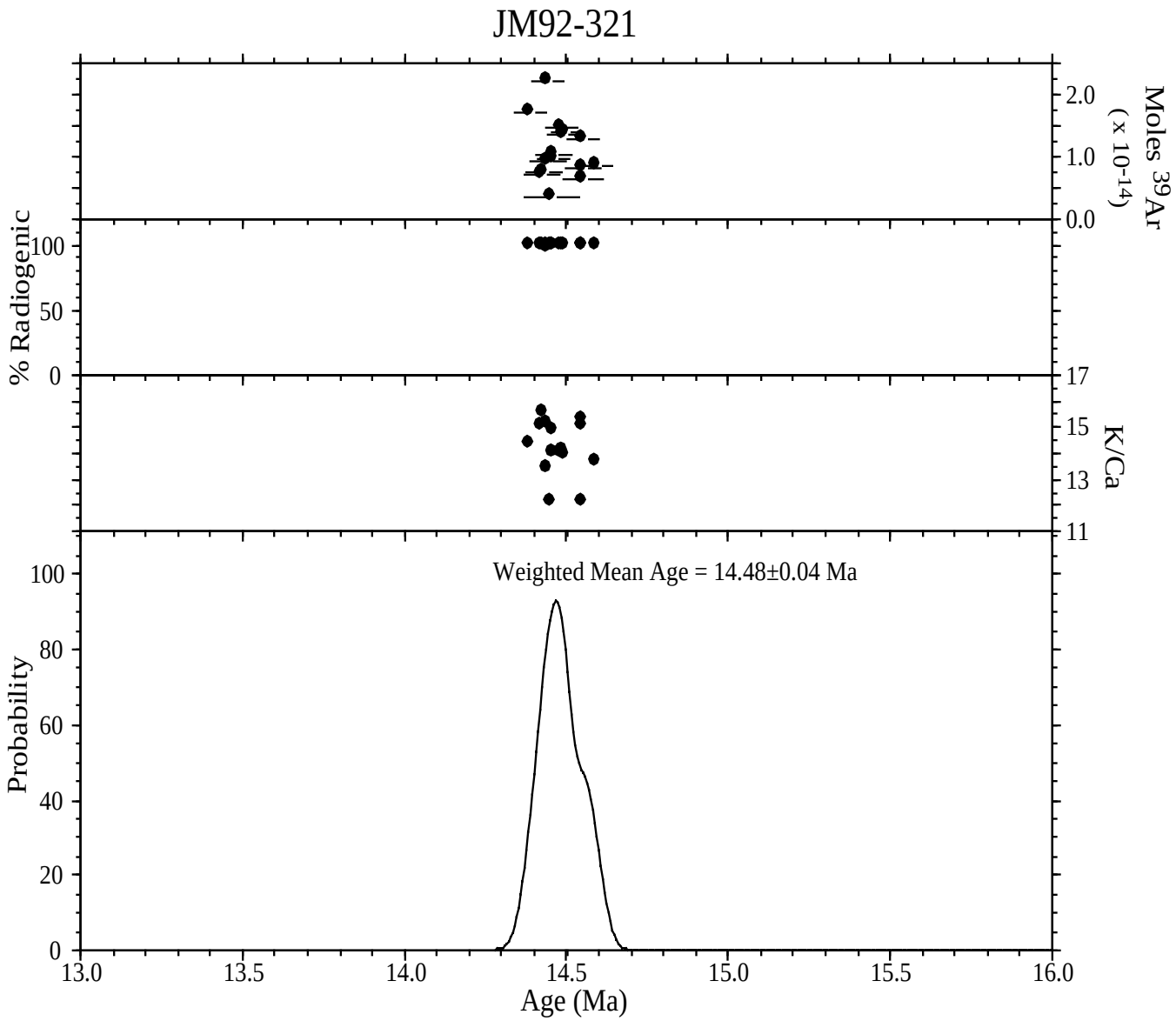

JM92-330
Moles 39Ar (x 10-14)
0.25
0.15
0.05
% Radiogenic
100
50
0
K/Ca
20
10
0
Weighted Mean Age = 14.15±0.11 Ma
Probability
30
20
10
0
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Age (Ma)


JM92-295
Moles 39Ar (x 10-14)
0.30
0.20
0.10
0.00
% Radiogenic
100
50
0
K/Ca
20
10
0
Weighted Mean Age = 14.21±0.13 Ma
Probability
25
20
15
10
5
0
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Age (Ma)


JM92-298
Moles 39Ar (x 10-14)
0.40
0.20
0.00
% Radiogenic
100
50
0
20
16
12
K/Ca
40
Weighted Mean Age = 14.22±0.08 Ma
30
20
10
0
Probability
13.0
13.5
14.0
14.5
15.0
15.5
16.0


JM92-302, 8991, redo
Moles 39Ar
0.40
0.20
0.00
% Rad
110
100
90
K/Ca
18
14
10
6
Probability
40
30
20
10
0
14.32
14.67
14.31 ± 0.03
14.00
14.10
14.20
14.30
14.40
14.50
14.60
14.70
14.80
14.90
Age (Ma)


JM92-302
% Radiogenic
100
50
0
Moles ^{39}Ar
(x 10^{-14})
0.08
0.04
0.00
K/Ca
30
20
10
0
Weighted Mean Age = 14.75±0.49 Ma
Probability
6
4
2
0
12
13
14
15
16
17
Age (Ma)


JM92-321
Moles 39Ar (x 10-14)
2.0
1.0
0.0
% Radiogenic
100
50
0
17
15
13
11
K/Ca
Weighted Mean Age = 14.48±0.04 Ma
Probability
100
80
60
40
20
0
13.0
13.5
14.0
14.5
15.0
15.5
16.0
Age (Ma)