

$^{40}\text{Ar}/^{39}\text{Ar}$ Geochronology Results from the Cave Canyon Quadrangle, Utah

by

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New Mexico Geochronology Research Laboratory

Bibliographic citation for this data report:

Utah Geological Survey and New Mexico Geochronology Research Laboratory, 2007, $^{40}\text{Ar}/^{39}\text{Ar}$ geochronology results from the Cave Canyon quadrangle, Utah: Utah Geological Survey Open-File Report 512, variously paginated, also available online, <<http://geology.utah.gov/online/ofr/ofr-512.pdf>>.



OPEN-FILE REPORT 512
UTAH GEOLOGICAL SURVEY
a division of
Utah Department of Natural Resources
2008

This Open-File Report makes available raw analytical data from laboratory procedures completed to determine the age of a rock sample collected during geologic mapping funded or partially supported by the Utah Geological Survey (UGS); the age corrects and supercedes that reported in NMGRL and UGS (2006). A calculation error led to reporting an incorrect age of 16.27 ± 0.17 Ma for sample 3-528 (NMGRL and UGS, 2006); the new, correct age is 11.95 ± 0.07 Ma. The reference listed in table 1 provides additional information such as the sample location, geologic setting, and significance or interpretation of the sample in the context of the area in which it was collected. This report was prepared by the New Mexico Geochronology Research Laboratory under contract to the UGS. These data are highly technical in nature and proper interpretation requires considerable training in the applicable geochronologic techniques.

Table 1. Sample numbers and locations.

Sample #	7.5' quadrangle	Latitude (N)	Longitude (W)	Reference
3-528	Cave Canyon	38° 18' 41.8"	112° 55' 40.4"	Rowley and others (2005)

Latitude and longitude in NAD83.

Disclaimer

This Open-File release is intended as a data repository for technical analytical information gathered in support of various geologic mapping projects. The data are presented as received from the New Mexico Geochronology Research Laboratory and do not necessarily conform to UGS technical or editorial standards. Therefore, it may be premature for an individual or group to take actions based on the contents of this report.

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References to geologic reports that cite or explain samples analyzed in this report

New Mexico Geochronolgy Research Laboratory and Utah Geological Survey, 2006, ⁴⁰Ar/³⁹Ar geochronology results for the Cave Canyon, Fountain Green North, Hilgard Mountain, Pine Park, Skinner Peaks, Tickville Spring, and Veyo quadrangles, Utah: Utah Geological Survey Open-File Report 473, variously paginated, also available online, <<http://geology.utah.gov/online/ofr/ofr-473.pdf>>.

Rowley, P.D., Vice, G.S., McDonald, R.E., Anderson, J.E., Machette, M.N., Maxwell, D.J., Ekren, E.B., Cunningham, C.G., Steven, T.A., and Wardlaw, B.R., 2005, Interim geologic map of the Beaver 30' x 60' quadrangle, Beaver, Piute, Iron and Garfield Counties, Utah: Utah Geological Survey Open-File Report 454, scale 1:100,000.

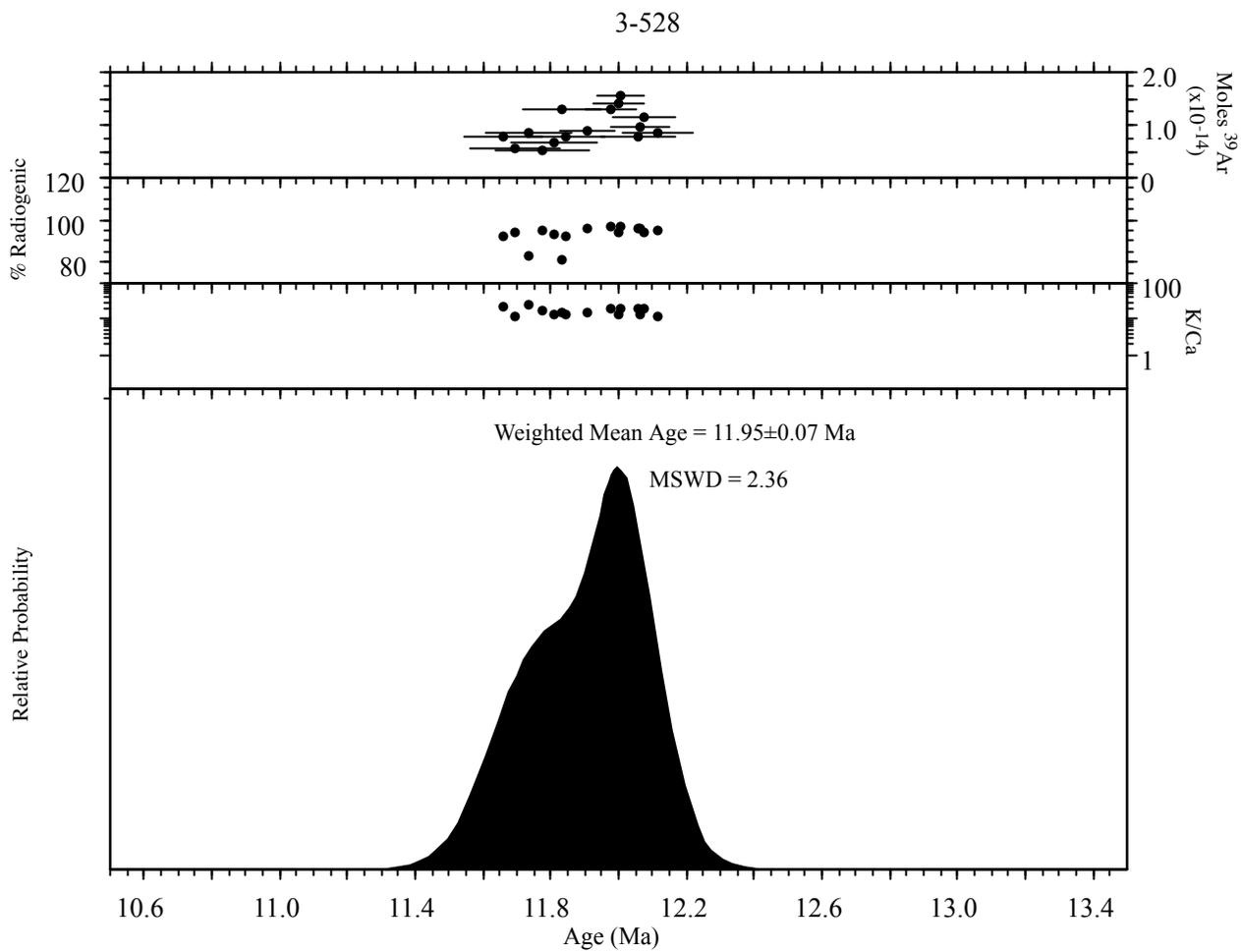


Figure 1. Age probability distribution diagram of 3-528 sanidine. All errors quoted at 2 sigma.

Table 1. $^{40}\text{Ar}/^{39}\text{Ar}$ analytical data.

ID	$^{40}\text{Ar}/^{39}\text{Ar}$	$^{37}\text{Ar}/^{39}\text{Ar}$	$^{36}\text{Ar}/^{39}\text{Ar}$ ($\times 10^{-3}$)	$^{39}\text{Ar}_K$ ($\times 10^{-15}$ mol)	K/Ca	$^{40}\text{Ar}^*$ (%)	Age (Ma)	$\pm 1\sigma$ (Ma)
03RB-058 , Sanidine, $J=0.0010924\pm 0.11\%$, $D=1.0063\pm 0.001$, NM-182N, Lab#=55203								
# 14	7.614	1.065	3.558	0.559	0.48	87.3	13.07	0.61
06	7.423	0.0140	1.341	2.364	36.4	94.7	13.80	0.15
11	7.348	0.0104	1.083	8.232	49.1	95.7	13.80	0.06
07	7.751	0.0180	2.365	7.987	28.4	91.0	13.85	0.11
04	7.240	0.0088	0.4867	4.858	58.3	98.0	13.93	0.09
08	7.281	0.0088	0.6175	4.014	57.8	97.5	13.94	0.12
05	7.346	0.0178	0.7729	12.318	28.7	96.9	13.98	0.05
15	7.259	0.0149	0.2727	8.282	34.2	98.9	14.10	0.08
03	7.248	0.0120	-0.1224	1.598	42.5	100.5	14.30	0.29
# 13	7.206	0.9236	-0.2492	0.585	0.55	102.1	14.45	0.65
# 09	8.223	0.0277	0.5644	5.717	18.4	98.0	15.81	0.10
# 10	8.382	0.0070	0.6938	6.874	72.5	97.6	16.04	0.10
# 02	10.94	3.415	3.654	0.681	0.15	92.7	19.93	0.67
# 01	9.904	3.591	-3.3780	0.526	0.14	113.1	21.99	0.90
# 12	19.58	3.573	27.37	0.796	0.14	60.2	23.14	0.74
Mean age $\pm 2\sigma$		n=8	MSWD=1.83		41.9 ± 24.1		13.93	0.09
3-528 , Sanidine, $J=0.0011422\pm 0.11\%$, $D=1.0063\pm 0.001$, NM-182N, Lab#=55204								
15	6.145	0.0221	1.585	5.533	23.1	92.4	11.66	0.10
13	6.054	0.0421	1.234	4.153	12.1	94.0	11.69	0.12
05	6.850	0.0193	3.849	6.299	26.5	83.4	11.74	0.11
07	6.028	0.0283	1.007	3.715	18.1	95.1	11.77	0.13
14	6.154	0.0402	1.383	4.828	12.7	93.4	11.81	0.11
01	7.076	0.0354	4.454	9.356	14.4	81.4	11.84	0.10
03	6.284	0.0390	1.756	5.730	13.1	91.8	11.85	0.10
06	6.029	0.0351	0.7951	6.435	14.5	96.2	11.91	0.07
04	6.031	0.0255	0.6824	9.494	20.0	96.7	11.98	0.07
09	6.213	0.0384	1.267	10.354	13.3	94.0	12.00	0.07
10	6.033	0.0262	0.6385	11.419	19.5	96.9	12.01	0.06
11	6.098	0.0247	0.7700	5.688	20.7	96.3	12.06	0.10
08	6.124	0.0370	0.8566	6.866	13.8	95.9	12.06	0.07
02	6.279	0.0265	1.357	8.455	19.3	93.6	12.08	0.08
12	6.196	0.0424	1.013	6.224	12.0	95.2	12.12	0.09
Mean age $\pm 2\sigma$		n=15	MSWD=2.36		16.9 ± 9.0		11.95	0.07
3-562 , K-feldspar, $J=0.0011823\pm 0.11\%$, $D=1.0063\pm 0.001$, NM-182N, Lab#=55205								
06	6.921	0.0049	9.162	25.209	104.2	60.9	8.97	0.10
04	6.878	0.0021	8.817	28.255	243.5	62.1	9.09	0.09
09	6.556	0.0022	7.352	30.461	227.9	66.9	9.33	0.07
05	6.985	0.0034	8.661	20.439	150.7	63.4	9.41	0.10
12	8.045	0.0028	12.22	28.155	183.9	55.1	9.43	0.09
07	6.957	0.0005	8.243	31.333	1025.5	65.0	9.62	0.08
02	6.193	0.0057	5.506	13.478	89.9	73.7	9.71	0.09
10	6.823	0.0016	7.520	19.754	314.7	67.4	9.79	0.09
13	6.619	0.0006	6.790	21.399	904.8	69.7	9.81	0.09
08	6.181	0.0031	5.261	19.151	164.5	74.9	9.84	0.09
03	6.388	0.0042	5.926	30.383	122.9	72.6	9.86	0.08
14	6.362	0.0067	5.609	13.982	76.5	74.0	10.01	0.09
11	6.161	0.0075	4.640	11.681	67.7	77.8	10.19	0.10
15	6.535	0.0035	5.823	25.017	144.4	73.7	10.24	0.06
01	7.736	0.0100	9.429	35.623	51.0	64.0	10.53	0.09
Mean age $\pm 2\sigma$		n=15	MSWD=24.45		258.1 ± 593.4		9.75	0.22

Notes:

Isotopic ratios corrected for blank, radioactive decay, and mass discrimination, not corrected for interfering reactions.

Errors quoted for individual analyses include analytical error only, without interfering reaction or J uncertainties.

Mean age is weighted mean age of Taylor (1982). Mean age error is weighted error of the mean (Taylor, 1982), multiplied by the root of the MSWD where MSWD>1, and also incorporates uncertainty in J factors and irradiation correction uncertainties.

Decay constants and isotopic abundances after Steiger and Jaeger (1977).

symbol preceding sample ID denotes analyses excluded from mean age calculations.

Ages calculated relative to FC-2 Fish Canyon Tuff sanidine interlaboratory standard at 28.02 Ma

Decay Constant (LambdaK (total)) = 5.543e-10

Discrimination = 1.0063 ± 0.001

Correction factors:

$$({}^{39}\text{Ar}/{}^{37}\text{Ar})_{\text{Ca}} = 0.0007 \pm 5\text{e-}05$$

$$({}^{36}\text{Ar}/{}^{37}\text{Ar})_{\text{Ca}} = 0.00028 \pm 1\text{e-}05$$

$$({}^{38}\text{Ar}/{}^{39}\text{Ar})_{\text{K}} = 0.0133$$

$$({}^{40}\text{Ar}/{}^{39}\text{Ar})_{\text{K}} = 0 \pm 0.0004$$
