K-Ar ages from Nevada and eastern California

P.C. Russell, E.H. McKee, and P.G. Vikre

Isochron/West, Bulletin of Isotopic Geochronology, v. 52, pp. 13-14

This page is intentionally left blank to maintain order of facing pages.

K-Ar AGES FROM NEVADA AND EASTERN CALIFORNIA

PAUL C. RUSSELL, EDWIN H. McKEE — *U.S. Geological Survey, Menlo Park, CA 94025*

PETER G. VIKRE — *ASARCO, Inc., Reno, NV 89502*

K-Ar age determinations from widely scattered localities in Nevada and eastern California are reported. The samples were collected by Peter G. Vikre of ASARCO Inc. and dated at the U.S. Geological Survey's Isotope Geology Laboratory in Menlo Park, California as part of a cooperative project to provide geochronologic information as an aid to resource assessment studies. This note reports K-Ar age determinations on 1 sericite, 2 muscovite, 8 alunite, and 2 whole rock samples. The alunites, sericite and at least one of the whole rock samples are considered to give ages of alteration. The muscovites are from mineralized veins. Mineral separates from rock specimens were prepared using techniques described by Silberman and McKee (1971). The two samples of basalt were prepared by crushing, sieving, and treating in acid, a procedure by McKee and Klock, (1979). These prepared samples were split and used for argon and potassium analyses. Potassium was analyzed by flame photometry using a lithium metaborate fusion technique, with the lithium serving as an internal standard (Ingamels, 1970). Argon analyses were done by standard isotope dilution, mass spectrometry techniques described by Dalrymple and Lanphere (1979). The constants used in the age calculations are those recommended by Steiger and Jager (1977): $\lambda_\epsilon + \lambda_\epsilon' = 0.581 \times 10 \times 10^{-10}\ yr^{-1}$, $\lambda\beta = 4.962 \times 10^{-10}\ yr^{-1}$, and $^{40}K/K$ total $= 1.167 \times 10^{4}\ mole/_{mole}$. Precision is at σ.

SAMPLE DESCRIPTIONS

1. *JV 82-1* K-Ar
Sericite from a quartz vein in the Jersey Valley pluton (40°09'40"N, 117°27'40"; Fish Creek Mountains, Lander Co., NV). *Analytical data:* $K_2O = 8.98$ wt %; $^*Ar^{40} = 4.1516 \times 10^{-10}$ mole/gm; $^{40}Ar^*/\Sigma^{40}Ar = 72.9\%$.
(sericite) 31.8 ± 0.2 Ma

2. *KM 81-1* K-Ar
Alunite from altered Tertiary volcanic rocks (40°50'48"N, 118°40'22"W; Kamma Mountains, Pershing Co., NV). *Analytical data:* $K_2O = 8.90$ wt %; $^*Ar^{40} = 5.2707 \times 10^{-11}$ mole/gm; $^{40}Ar^*/\Sigma^{40}Ar = 40.0\%$.
(alunite) 41.1 ± 0.1 Ma

3. *KM 87-1* K-Ar
Alunite from altered Tertiary volcanic rocks (40°50'48"N, 118°40'22"W; Rosebud Peak, Kamma Mountains, Pershing Co., NV). *Analytical data:* $K_2O = 9.19$ wt %; $^*Ar^{40} = 7.8576 \times 10^{-11}$ mole/gm; $^{40}Ar^*/\Sigma^{40}Ar = 42.9\%$.
(alunite) 5.9 ± 0.1 Ma

4. *SA 86-1* K-Ar
Muscovite from a gold bearing vein (40°17'30"N, 118°09'48"W; near Nenzel Hill, Rochester district, Pershing Co., NV). *Analytical data:* $K_2O = 9.25$ wt %; $^*Ar^{40} = 1.5692 \times 10^{-9}$ mole/gm; $^{40}Ar^*/\Sigma^{40}Ar = 93.9\%$.
(muscovite) 114.1 ± 4.0 Ma

5. *FC 86-1* K-Ar
Muscovite from the Fondaway Canyon gold deposit (39°48'05"N; 118°11'35"W; Stillwater Range, Churchill Co., NV). *Analytical data:* $K_2O = 3.72$ wt %; $^*Ar^{40} = 5.1695 \times 10^{-10}$ mole/gm; $^{40}Ar^*/\Sigma^{40}Ar = 94.5\%$.
(muscovite) 94.0 ± 2.7 Ma

6. *DC 31-100.5* K-Ar
Altered gabbro, Dixie Comstock Mine (39°52'12"N, 118°01'00"; Stillwater Range, Churchill Co., NV). *Analytical data:* $K_2O = 2.11$ wt %; $^*Ar^{40} = 4.1378 \times 10^{-11}$ mole/gm; $^{40}Ar^*/\Sigma^{40}Ar = 60.0\%$.
(whole rock) 13.6 ± 0.4 Ma

7. *DC 29-193* K-Ar
Altered gabbro, Dixie Comstock Mine (39°52'12"N, 118°01'00"W; Stillwater Range, Churchill Co., NV). *Analytical data:* $K_2O = 1.08$ wt %; $^*Ar^{40} = 1.1885 \times 10^{-10}$ mole/gm; $^{40}Ar^*/\Sigma^{40}Ar = 62.6\%$.
(whole rock) 74.9 ± 2.2 Ma

8. *CR 86-1* K-Ar
Alunite from altered Tertiary volcanic rocks (39°28'07"N, 119°51'00"W; Carson Range, Washoe Co., NV). *Analytical data:* $K_2O = 1.78$ wt %; $^*Ar^{40} = 2.8667 \times 10^{-11}$ mole/gm; $^{40}Ar^*/\Sigma^{40}Ar = 11.7\%$.
(alunite) 11.2 ± 0.1 Ma

9. *CR 86-2* K-Ar
Alunite from altered Tertiary volcanic rocks (39°28'00"N, 119°51'00"W; Carson Range, Washoe Co., NV). *Analytical data:* $K_2O = 3.56$ wt %; $^*Ar^{40} = 5.8517 \times 10^{-11}$ mole/gm; $^{40}Ar^*/\Sigma^{40}Ar = 33.6\%$.
(alunite) 11.4 ± 0.4 Ma

10. *DMV 83-12* K-Ar
Alunite from a quartz vein in Tertiary rhyolite tuff (39°11'20"N, 117°43'13"W; Desatoya Mountains, Lander Co., NV). *Analytical data:* $K_2O = 3.03$ wt %; $^*Ar^{40} = 8.3379 \times 10^{-11}$ mole/gm; $^{40}Ar^*/\Sigma^{40}Ar = 56.5\%$.
(alunite) 19.0 ± 0.4 Ma

11. *SJC 83-7* K-Ar
Alunite from altered Tertiary volcanic rocks (39°07'30"N, 117°16'35"W; San Juan Canyon, Toiyabe Range, Nye Co., NV). *Analytical data:* $K_2O = 5.94$ wt %; $^*Ar^{40} = 2.1386 \times 10^{-10}$ mole/gm; $^{40}Ar^*/\Sigma^{40}Ar = 56.8\%$.
(alunite) 24.8 ± 0.8 Ma

12. *MD 83-2* K-Ar
Alunite from altered granodiorite (38°22'03"N, 119°07'02"W; Pittsburg-Liberty Mine, Masonic District, Mono Co., CA). *Analytical data:* $K_2O = 2.92$ wt %; $^*Ar^{40} = 5.6878 \times 10^{-11}$ mole/gm; $^{40}Ar^*/\Sigma^{40}Ar = 34.0\%$.
(alunite) 13.5 ± 0.4 Ma

REFERENCES

Dalrymple, G. B., and Lanphere, M. A. (1969) Potassium-argon dating-principles, techniques, and applications to geochronology: W. H. Freeman Co., San Francisco.

Ingamells, C. O. (1970) Lithium metaborate flux in silicate analysis: Analytical Chemica Acta, v. 52, no. 2, p. 323.

McKee, E. H., and Klock, P. R. (1979) K-Ar ages of basalt sills, Shikoku Basin and Daiti Basin, Philippine Sea, Leg 58, Deep-Sea Drilling Project: Deep Sea Drilling Project Initial Report, v. 58, p. 921–922.

Silberman, M. L., and McKee, E. H. (1971) K-Ar ages of granitic plutons in north-central Nevada: Isochron/West, no. 1, p. 15–32.

Steiger, R. H., and Jager, E. (1977) Subcommission on geochronology convention on the use of decay constants in geo- and cosmochronology: Earth and Planetary Science Letters, v. 36, p. 359.