K-Ar and Rb-Sr age determinations of orbicular granite, Sandia Mountains, New Mexico

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K-AR AND RB-SR AGE DETERMINATIONS OF ORBICULAR GRANITE SANDIA MOUNTAINS, NEW MEXICO

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Orbicular granite from the Sandia Mountains has been known for several years (J. P. Fitzsimmons, personal communication; 1961) although its origin is still uncertain. R. D. Enz is currently completing the mapping, petrology, petrography, and chemistry of the orbicular rocks and his report will be published later. The intent of this brief report is to comment on recently determined K-Ar and Rb-Sr age determinations on biotite separates and one whole rock to test their temporal relationship with the Sandia Granite which has been assigned a date of 1.48 ± 0.02 b.y. by Brookins (1974) based on the work of previous investigators plus more recent work (J. E. Taggart and D. G. Brookins, this volume).

The constants used are as follows: ^{40}K: $\lambda_e = 5.89 \times 10^{-11}/y$, $\lambda_\beta = 4.76 \times 10^{-10}/y$, $(^{40}K/K)_{atomic} = 1.18 \times 10^{-4}$; ^{87}Rb: $\lambda_\beta = 1.39 \times 10^{-11}/y$; Rb and Sr analyses by isotope dilution.

SAMPLE DESCRIPTIONS

1. UAKA 74-12 K-Ar (biotite) 1334 ± 28 m.y.
Orbicular Sandia granite (106°28′07″W, 35°12′57″N; Sandia Crest Quad., Bernalillo Co., NM). The biotite shells are surrounded by oligoclase shells. They in turn surround an inner shell of plagioclase. Analytical data: K = 7.79%; $^{*40}Ar = 26{,}961.6 \times 10^{-12}$ m/g; $^{*40}Ar/\Sigma Ar = 98.6\%$. Collected by: R. D. Enz, UNM; dated by: M. Shafiqullah, University of Arizona.

2. UAKA 74-13 K-Ar (biotite) 1336 ± 27 m.y.
Orbicular Sandia granite (106°28′07″W, 35°12′57″N; Sandia Crest Quad., Bernalillo Co., NM). The biotite shells are surrounded by oligoclase shells. They in turn surround an inner shell of oligoclase and biotite. Analytical data: K = 8.39%; $^{*40}Ar = 29{,}102.2 \times 10^{-12}$ m/g; $^{*40}Ar/\Sigma Ar = 98.4\%$. Collected by: R. D. Enz, UNM; dated by: M. Shafiqullah, University of Arizona.

3. UAKA 74-14 K-Ar (biotite) 1313 ± 28 m.y.
Biotite-rich, Sandia granite (106°28′03″W, 35°12′56″N; Sandia Crest Quad., Bernalillo Co., NM). Analytical data: K = 8.02%; $^{*40}Ar = 27{,}169.8 \times 10^{-12}$ m/g; $^{*40}Ar/\Sigma Ar = 98.6\%$. Collected by: R. D. Enz, UNM; dated by: M. Shafiqullah, University of Arizona.

4. UNM-1208 Rb-Sr (biotite) 1152 ± 45 m.y.
Orbicular Sandia granite (106°28′07″W, 35°12′57″N; Sandia Crest Quad., Bernalillo Co., NM). The biotite are surrounded by oligoclase shells; they in turn surround an inner shell of oligoclase. The biotite has been partially chloritized. Analytical data: Rb(ppm) = 646.6, Sr(ppm) = 118.1, $^{87}Sr/^{86}Sr) = 0.9649$, $(^{87}Sr/^{86}Sr)_0 = 0.703$ (assumed). Collected by: D. G. Brookins and R. D. Enz, UNM; dated by: UNM Geochronology Laboratory.

5. UNM-1209 Rb-Sr (whole rock) 1550 ± 50 m.y.
Orbicular Sandia granite (106°28′07″W, 35°12′57″N; Sandia Crest Quad., Bernalillo Co., NM). Alternating shells of biotite and oligoclase with minor microcline, quartz, magnetite; rock minimum dimension

greater than ten times maximum dimension of largest constituent mineral. Analytical data: Rb(ppm) = 441.4, Sr(ppm) = 290.6, ($^{87}Sr/^{86}Sr$) = 0.8006, ($^{87}Sr/^{86}Sr)_o$ = 0.703 (assumed). Collected by: D. G. Brookins and R. D. Enz, UNM; dated by: UNM Geochronology Laboratory.

Comments: The new K-Ar determinations for biotite (Nos. 1, 2, 3) are in agreement with the published K-Ar date of 1300 m.y. for biotite (Aldrich and others, 1958) from the Sandia Granite (location not given). The biotite mineral Rb-Sr date (No. 4) is probably too low due to chloritization. The whole rock orbicular granite (No. 5) may be too high and it is possible that we have analyzed material which more properly falls on the $^{87}Sr/^{86}Sr$-high, $^{87}Rb/^{86}Sr$-low side of a 1500 m.y. isochron. This remains to be tested. Finally, the data are not significantly different from that for the non-orbicular Sandia Granite (see Brookins, 1974).

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