K-Ar ages for pegmatitic and metamorphic muscovites, Sandia Mountains, New Mexico

D.G. Brookins and M. Shafiqullah

Isochron/West, Bulletin of Isotopic Geochronology, v. 12, pp. 9

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

K-AR AGES FOR PEGMATITIC AND METAMORPHIC MUSCOVITES, SANDIA MOUNTAINS, NEW MEXICO

D. G. Brookins
Department of Geology
University of New Mexico
Albuquerque, NM 87131
and
M. Shafiqullah
Department of Geosciences
University of Arizona
Tucson, AZ 85721

Three muscovites from a folded pegmatite, a non-folded pegmatite, and a metasedimentary rock from the Rincon area, northern Sandia Mountains, New Mexico have been analyzed by the K-Ar method. The purpose is threefold: (1) To see if the nonfolded pegmatitic muscovite is temporally related to the Sandia Granite; field evidence suggest this to be the case but the relationships are not certain. (2) To determine if the age of muscovite from the folded pegmatite is different from that of the non-folded pegmatite; field evidence suggests in places that the folded pegmatites may have been emplaced earlier than the non-folded pegmatites. (3) To attempt to obtain a pre-Sandia Granite age by examining muscovite from the metasedimentary rocks removed from the contact aureole of the Sandia Granite and from local pegmatites or other quartzo-feldspathic rocks which infiltrate the Rincon area. The metasedimentary rocks are not suited for Rb-Sr whole rock study because of their hybrid nature (e. g., infiltration by other rocks; predominately granitic in composition).

From the three ages reported below we can only speculate that the three muscovites were all probably formed within a close time span; probably related to the crystallization of the Sandia Granite at 1.48 ± 0.02 b.y. age (Brookins, 1974). It may be significant that these three dates are older than the K-Ar dates reported from biotites from orbicular granite, biotite monzonite, and non-orbicular granite in the main mass of the Sandia Mountains (see Brookins and others, this volume) which range from 1,300 to 1,335 m.y.; alternately, the younger dates may reflect the commonly observed lower retentivity for $*^{40}Ar$ of biotite relative to muscovite. A final speculation is that the formation of the Sandia Granite, the pegmatites, and other quartzo-feldspathic rock was part of a regional event affecting all parts of the Rincon as well as metamorphic rocks to the south of the Sandia Granite in Tijeras Canyon.

Constants used are: ^{40}K: $\lambda_e = 5.89 \times 10^{-11}/y$, $\lambda_\beta = 4.76 \times 10^{-10}/y$, $(^{40}K/K)_{atomic} = 1.18 \times 10^{-4}$.

SAMPLE DESCRIPTIONS

1. UAKA 84-15 K-Ar (muscovite) 1417 ± 30 m.y.
Pegmatite (106°29′33″W, 35°12′33″N; Sandia Crest Quad., Bernalillo Co., Rincon area, NM) in metamorphic rocks near the Sandia granite. The pegmatite is folded. Analytical data: K = 8.90%; $*^{40}Ar$ = 33,568.6 x 10^{-12} m/g; $*^{40}Ar/\Sigma Ar$ = 98.5%. Collected by: D. G. Brookins, J. E. Taggart, and S. L. Bolivar; dated by: UNM Geochronology Laboratory.

2. UAKA 74-16 K-Ar (muscovite) 1384 ± 29 m.y.
Pegmatite (106°29′33″W, 35°12′33″N; Sandia Crest Quad., Bernalillo Co., Rincon area, NM) in metamorphic rocks near Sandia granite. Analytical data: K = 8.87%; $*^{40}Ar$ = 32,338.3 x 10^{-12} m/g; $*^{40}Ar/\Sigma Ar$ = 98.5%. Collected by: D. G. Brookins, J. E. Taggart, and S. L. Bolivar; dated by: UNM Geochronology Laboratory.

3. UAKA 74-17 K-Ar (muscovite) 1376 ± 29 m.y.
Metasediments of the Juan Tabo series (106°29′17″W, 35°12′57″N; Sandia Crest Quad., Bernalillo Co., Rincon area, NM). Analytical data: K = 8.74%; $*^{40}Ar$ = 31,629.3% x 10^{-12} m/g; $*^{40}Ar/\Sigma Ar$ = 98.6%. Collected by: D. G. Brookins, J. E. Taggart, and S. L. Bolivar; dated by: UNM Geochronology Laboratory.

REFERENCES

Brookins, D. G. (1974), Radiometric age determinations from the Sandia Granite, New Mexico: Isochron/West, no. 10, p. 11-14.