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K-AR AGES FOR CLAY-SIZE AND SILT-SIZE FRACTIONS OF URANIUM ORE FROM THE GRANTS MINERAL BELT, NEW MEXICO

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Eleven samples of clay minerals (<2 μ size) and silt-clay mineral fractions (2 to 62 μ) samples from the Ambrosia Lake and Laguna Districts, Grants Mineral Belt have been analyzed by the K-Ar method. The purpose of this study was to determine if the K-Ar method could successfully be applied to the dating of the age of uranium mineralization in the Grants Mineral Belt because of the uncertainties involved in published U-Pb dating (see summary in Brookins, 1976). Further, Rb-Sr dates have been obtained from some of the same samples but not from the same split; the Rb-Sr data are reported in Brookins (1976) who reports a Rb-Sr minimum age of sedimentation for authigenic montmorillonites of 147 ± 8 m.y. and probable ages of uranium mineralization for K-bearing chloritic clay minerals from Ambrosia Lake and Smith Lake of 139 ± 10 m.y. and from the Jackpile-Paguate Mines (Laguna District) of 110-115 ± 10 m.y. The data below rather convincingly demonstrate that the K-Ar method is not suitable for either the dating of minimum age of sedimentation or for uranium mineralization but may be of some help in commenting on provenance for the silt-size fraction.

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

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SAMPLE DESCRIPTIONS

1. CS-1 K-Ar
Minus-two micron fraction clay minerals (35°07′55″N., 107°19′50″W.; Jackpile Mine, Laguna District, Valencia Co., NM). Sample is dominantly 1Md illite plus mixed layer illite-montmorillonite; minor kaolinite. Analytical data: K = 1.86%; $^{*40}Ar = 197.0 \times 10^{-12}$ m/g; $^{*40}Ar/\Sigma Ar = 60.4\%$; collected by: M. J. Lee; dated by: M. Shafiqullah.
(illite) 58.7±1.4 m.y.

2. FS-1 K-Ar
Minus-two micron fraction clay minerals (35°07′55″N., 107°19′50″W.; Jackpile Mine, Laguna District, Valencia Co., NM). Sample is dominantly 1Md illite plus mixed layer illite-montmorillonite with minor kaolinite and organic matter. Analytical data: K = 2.11%; $^{*40}Ar = 172.3 \times 10^{-12}$ m/g; $^{*40}Ar/\Sigma Ar = 60.5\%$; collected by: M. J. Lee; dated by: M. Shafiqullah.
(illite) 45.4±1.0 m.y.

3. AL-35-209 K-Ar
Minus-two micron fraction of chlorite-rich and 1Md illite-rich clay minerals (35°22′30″N., 107°45′10″W.; Section 35 Mine, Ambrosia Lake District, McKinley Co., NM). Minor amounts of mixed layer illite-montmorillonite and organic matter. Analytical data: K = 0.833%; $^{*40}Ar = 155.2 \times 10^{-12}$ m/g; $^{*40}Ar/\Sigma Ar = 71.2\%$; collected by: D. G. Brookins, M. J. Lee; dated by: M. Shafiqullah.
(chlorite, illite) 104.3±2.5 m.y.

4. AL-35-306 K-Ar
Minus-two micron fraction of chlorite-rich and 1Md illite-rich clay minerals (35°22′30″N., 107°45′10″W.; Section 35 Mine, Ambrosia Lake District, McKinley Co., NM). Minor amounts of kaolinite, montmorillonite, organic matter. Analytical data: K = 1.08%; $^{*40}Ar = 271.1 \times 10^{-12}$ m/g; $^{*40}Ar/\Sigma Ar = 79.2\%$; collected by: D. G. Brookins, M. J. Lee; dated by: M. Shafiqullah.
(chlorite, illite) 138.9±30 m.y.

5. AL-35-201 K-Ar
Two to sixty-two micron fraction of whole rock (35° 22′30″N., 107°45′10″W.; Section 35 Mine, Ambrosia Lake District, McKinley Co., NM). Rock chips with authigenic clay minerals, silt-size K-feldspar, organic matter. Analytical data: K = 3.16%; $^{*40}Ar = 809.3 \times 10^{-12}$ m/g; $^{*40}Ar/\Sigma Ar = 87.2\%$; collected by: D. G. Brookins, M. J. Lee; dated by: M. Shafiqullah.
(whole rock) 141.7±2.9 m.y.

6. AL-35-205 K-Ar
Two to sixty-two micron fraction of whole rock (35° 22′30″N., 107°45′10″W.; Section 35 Mine, Ambrosia Lake District, McKinley Co., NM). Rock chips with authigenic clay minerals, silt-size K-feldspar, organic matter. Analytical data: K = 1.43%; $^{*40}Ar = 650.3 \times \times 10^{-12}$ m/g; $^{*40}Ar/\Sigma Ar = 81\%$; collected by: D. G. Brookins, M. J. Lee; dated by: M. Shafiqullah.
(whole rock) 244.3±5.2 m.y.

7. AL-35-207 K-Ar
Minus-two micron fraction of whole rock (35°22′30″N.,

7. (continued)
107°45′10″W.; Section 35 Mine, Ambrosia Lake District, McKinley Co., NM). Volcanic ash-derived montmorillonite and illite-montmorillonite; very little organic matter. Analytical data: K = 3.01%; ^{*40}Ar = 365.8 x 10^{-12} m/g; ^{*40}Ar/ΣAr = 85.2%; collected by: D. G. Brookins; dated by: M. Shafiqullah.
(whole rock) 68.7±1.5 m.y.

8. AL-35-305 K-Ar
Minus-two micron fraction of whole rock (35°22′30″ N., 107°45′10″W.; Section 35 Mine, Ambrosia Lake District, McKinley Co., NM). Volcanic ash-derived montmorillonite and mixed layer illite-montmorillonite with very little organic matter. Analytical data: K = 2.67%; ^{*40}Ar = 405.6 x 10^{-12} m/g; ^{*40}Ar/ΣAr = 89.5%; collected by: D. G. Brookins, M. J. Lee; dated by: M. Shafiqullah. (whole rock) 85.5±1.8 m.y.

9. AL-23-303 K-Ar
Minus-two micron fraction of illite-rich and chlorite-rich clay minerals (35°26′00″N., 107°52′02″W.; Section 23 Mine, Ambrosia Lake District, McKinley Co., NM). Illite and chlorite dominant, rich in organic matter, some kaolinite. Analytical data: K = 1.08%; ^{*40}Ar = 112.6 x 10^{-12} m/g; ^{*40}Ar/ΣAr = 45.6%; collected by: D. G. Brookins; dated by: M. Shafiqullah. (illite, chlorite) 59.1±1.6 m.y.

10. AL-23-211 K-Ar
Minus-two micron fraction of chlorite-rich clay minerals (35°26′00″N., 107°52′02″W.; Section 23 Mine, Ambrosia Lake District, McKinley Co., NM). Illite (some mixed layer) and kaolinite with abundant organic matter. Analytical data: K = 0.474%; ^{*40}Ar = 52.6 x 10^{-12} m/g; ^{*40}Ar/ΣAr = 18.0%; collected by: D. G. Brookins, M. J. Lee; dated by: M. Shafiqullah.
(chlorite) 62.9±4.1 m.y.

11. AL-23-302 K-Ar
Minus-two micron fraction of chlorite-rich clay minerals (35°26′00″N., 107°52′02″W.; Section 23 Mine, Ambrosia Lake District, McKinley Co., NM). Relatively abundant illite and organic matter; minor kaolinite. Analytical data: K = 1.11%; ^{*40}Ar = 125.3 x 10^{-12} m/g; ^{*40}Ar/ΣAr = 50.9%; collected by: D. G. Brookins, M. J. Lee; dated by: M. Shafiqullah.
(chlorite) 63.9±1.6 m.y.

REFERENCE

Brookins, D. G. (1976) Uranium deposits of the Grants, New Mexico, mineral belt: US-ERDA Tech. Rpt., GJBX-16(76)