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K-AR AGE OF MINERALIZATION AT BUCKHORN, EUREKA COUNTY, NEVADA

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Analytical procedures and equipment are the same as those reported in McKee and others (1971). Constants used in the age calculation are: $\lambda_{\epsilon} = 0.585 \times 10^{-10} \text{ yr}^{-1}$, $\lambda_{\mu} = 4.72 \times 10^{-10} \text{ yr}^{-1}$, $K^{40}/K_{\text{total}} = 1.22 \times 10^{-4} \text{ gm/gm}$. Plus/minus (\pm) represents estimated analytical uncertainty only, at the one sigma level.

GEOLOGIC DISCUSSION

Gold- and silver-bearing veins at the Buckhorn mine, on the east side of the Cortez Mountains about 30 miles south of Beowawe, cut Tertiary sedimentary rocks and overlying basaltic andesites. The veins are controlled by faults associated with a north-northwest-trending horst. Primary sulfide minerals in the veins are mostly pyrite and marcasite. Gray chalcedonic quartz, adularia, montmorillonite, and kaolinite are gangue minerals (Wells and others, 1971).

Wells and others (1971) suggest that mineralization may have resulted from ore-forming fluids related to rhyolite plugs and flows that intrude and overlie the basaltic andesite. Plagioclase from a sample of basaltic andesite yielded an age of $16.3 \pm 0.9 \text{ m.y.}$, and sanidine from a sample of the rhyolite gave an age of $15.3 \pm 0.4 \text{ m.y.}$ (Wells and others, 1971). The K-Ar age of the adularia separated from a chalcedony-adularia vein at Buckhorn gave an age of $14.6 \pm 0.4 \text{ m.y.}$, which, within analytical uncertainty, is the same as that of the rhyolite.

SAMPLE DESCRIPTION

1. Buckhorn K-Ar (adularia) $14.6 \pm 0.4 \text{ m.y.}$
 Chalcedony-adularia vein (S center Sec. 30 unsurveyed, T27N, R49E; $40^{\circ}11'25''\text{N}$, $116^{\circ}29'27''\text{W}$; near Buckhorn mine, Eureka Co., NV). Breccia zone in basalt consisting of very fine grained adularia with montmorillonite and kaolinite filling cavities in gray, chalcedonic quartz. Analytical data: $K_2O = 12.47\%$; $*Ar^{40} = 2.709 \times 10^{-10} \text{ mole/gm}$; $*Ar^{40}/\square Ar^{40} = 52.4\%$. Collected by: J. D. Wells, U. S. Geological Survey, Denver. Dated by: M. L. Silberman, U. S. Geological Survey, Menlo Park. Comment: The sample collected for dating contained 2.6 ppm Au, 1.5 ppm Ag, and 300 ppm As. The structural state of the feldspar is intermediate between that of orthoclase and sanidine, as determined by the three-reflection X-ray diffraction method of Wright (1968) (R. A. Koski, written communication, 1973). Both structures retain argon well (Evernden and James, 1964; Evernden and Kistler, 1970).

REFERENCES

- Evernden, J. F., and James, G. T. (1964) Potassium-argon dates and the Tertiary floras of North America: *Am. Jour. Sci.*, v. 262, p. 945-974.
- Evernden, J. F., and Kistler, R. W. (1970) Chronology of emplacement of Mesozoic batholithic complexes in California and western Nevada: *U. S. Geol. Survey Prof. Paper* 623.
- McKee, E. H., Silberman, M. L., Marvin, R. F., and Obradovich, J. D. (1971) A summary of radiometric ages of Tertiary volcanic rocks in Nevada and eastern California. Part I, Central Nevada: *Isochron/West*, no. 2, p. 21-42.
- Wells, J. D., Elliott, J. E., and Obradovich, J. D. (1971) Age of the igneous rocks associated with ore deposits, Cortez-Buckhorn area, Nevada: *U. S. Geol. Survey Prof. Paper* 750-C, p. C127-C135.
- Wright, T. L. (1968) X-ray and optical study of alkali feldspar: II. An X-ray method for determining the composition and structural state from measurement of 2θ values for three reflections: *Am. Mineralogist*, v. 53, nos. 1-2, p. 88-104.