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K-AR DATES ON GRANODIORITE AND RELATED SCHEELITE-BEARING QUARTZ VEINS AT TUNGSTEN, PERSHING COUNTY, NEVADA

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At Tungsten, in the central Eugene Mountains of Pershing County, Nevada, a series of granodiorite intrusives have cut sedimentary rocks of the upper Triassic Raspberry Formation. Locally, the Raspberry Formation is composed of shale (regionally metamorphosed to slate and schist) and thin-bedded limestone. Near contacts with granodiorite, the sedimentary rocks have been further metamorphosed to hornfels and tactite. Tungsten mineralization, in the form of scheelite, is associated with at least one of the granodiorite intrusives, and has formed mineable concentrations in certain zones within the tactite bodies.

Nine samples of granodiorite and quartz vein material were selected for K-Ar age dating to aid in determining age relationships between the scheelite occurrences and the granodiorite masses. Although ranging in age from late Cretaceous to early Tertiary, the dates allow separation of the rocks sampled into four distinct age groups.

Of the samples taken, the oldest date obtained was from a dacite dike cut in a core hole southeast of the old town of Tungsten (Sample no. 1: 101 ± 4 m.y.). The geologic relationship of this rock to the rocks seen in outcrop at Tungsten is yet to be determined.

In the next youngest age group are included the Olsen stock (Sample no. 2: 88.9 ± 3.2 m.y.). The Olsen stock forms the largest intrusive outcrop in the Tungsten area, and the Northwest dike is one of a series of northwest trending dikes which outcrop in the area west of the Olsen and Springer stocks. Krueger and Schilling (1971) obtained a date of 90 ± 2.7 m.y. from a sample taken from the western margin of the Springer stock, indicating that a portion of the Springer stock must also be included in this age group.

The third and largest sample grouping includes an additional sample of the Springer stock (Sample no. 5: 78.4 ± 2.9 m.y.), the Forge stock (Sample no. 4: 78.9 ± 2.9 m.y.), the Uncle Sam stock (Sample no. 7: 74 ± 2.8 m.y.), the Springer quartz veins (Sample no. 6: 76 ± 2.7 m.y.), and the Sutton quartz veins (Sample no. 8: 72 ± 2.6 m.y.). Both the Springer and Uncle Sam stocks lie to the immediate south of the large Olsen stock, near the center of the Tungsten district. The Forge stock is about two miles south of Tungsten.

Only one sample falls within the last and youngest age group. The Southwest stock (Sample no. 9: 66.5 ± 2.5 m.y.), which outcrops about one mile southwest of the central Tungsten area, is assigned to early Tertiary age.

With the exception of Sample no. 1, all intrusives sampled are known to have scheelite-bearing tactite bodies associated with them. The principal scheelite concentrations at Tungsten, however, occur near the margins of the Springer stock. Age dates indicate that the Springer, Uncle Sam, and Forge stocks are essentially the same age (within the limits of the laboratory procedure), and that the scheelite-bearing quartz veins which cut both the Springer stock and the Sutton tactite bodies are also of this same general age. The cross-cutting relationship of these quartz veins to both the Springer granodiorite and the mineralized tactites indicates that although they are generally the same age as the Springer-Uncle Sam granodiorite, the veins and their contained scheelite are relatively younger than the intrusive mass.

From this information, it is inferred that at least a portion of the scheelite mineralization at Tungsten postdates the solidification of the source intrusive, and this late-stage mineralization is believed to have enriched the primary tactite ore bodies.

SAMPLE DESCRIPTIONS

1. NM-5 Dike K-Ar (biotite) 101 ± 4 m.y.
Altered dacite porphyry dike (drill hole in sec. 2, T. 33 N., R. 34 E.; Pershing Co., NV). Analytical data: K = 2.468%; $*Ar^{40}$ = 0.01823 ppm. Dated by: Geochron Laboratories, Inc., for Refractory Metals Products Department, General Electric Co.; mineral separates prepared by: Geochron Laboratories. Collected by: J. V. Tingley.

2. Northwest dike K-Ar (muscovite) 88.9 ± 3.2 m.y.
Greisenized granite porphyry (SE¼SE¼SW¼ sec. 27, T. 34 N., R. 33 E.; Pershing Co., NV). Analytical data: K = 8.341%; $*Ar^{40}$ = 0.05421 ppm. Dated by: Geochron Laboratories, Inc., for Refractory Metals Products

Department, General Electric Co.; mineral separates prepared by: Nevada Bureau of Mines and Geology. Collected by: J. V. Tingley.

3. Olsen stock K-Ar (biotite) 86.8 ± 3.2 m.y.
Biotite granodiorite (NW¼SW¼SW¼ sec. 26, T. 34 N., R. 33 E.; Pershing Co., NV). Analytical data: K = 7.049%; $*Ar^{40}$ = 0.04471 ppm. Dated by: Geochron Laboratories, Inc., for Refractory Metals Products Department, General Electric Co.; mineral separates prepared by: Nevada Bureau of Mines and Geology. Collected by: J. V. Tingley.

4. Forge stock K-Ar (biotite) 78.9 ± 2.9 m.y.
Biotite granodiorite (SW¼NE¼SW¼ sec. 38, T. 34 N., R. 33 E.; Pershing Co., NV). Analytical data: K = 6.920%; $*Ar^{40}$ = 0.03979 ppm. Dated by: Geochron Laboratories, Inc. for Refractory Metals Products Department, General Electric Co.; mineral separates prepared by: Nevada Bureau of Mines and Geology. Collected by: J. V. Tingley.

5. Springer stock K-Ar (biotite) 78.4 ± 2.9 m.y.
Biotite granodiorite (SW¼NW¼NW¼ sec. 35, T. 34 N., R. 33 E.; Pershing Co., NV). Analytical data: K = 6.127%, $*Ar^{40}$ = 0.03503 ppm. Dated by: Geochron Laboratories, Inc., for Refractory Metals Products Department, General Electric Co.; mineral separates prepared by: Geochron Laboratories. Collected by: J. V. Tingley.

6. Springer quartz veins K-Ar (adularia) 76 ± 2.7 m.y.
Quartz-adularia veins with scheelite crystals, veins cut Springer granodiorite SE¼NW¼ sec. 35, T. 34 N., R. 33 E.). Analytical data: K = 12.667%, $*Ar^{40}$ = 0.07014 ppm. Dated by: Geochron Laboratories, Inc., for Refractory Metals Products Department, General Electric Co.; mineral separates prepared by: Nevada Bureau of Mines and Geology. Collected by: J. V. Tingley.

7. Uncle Sam stock K-Ar (biotite) 74 ± 2.8 m.y.
Biotite granodiorite (E½SW¼SW¼ sec. 26, T. 34 N., R. 33 E.; Pershing Co., NV). Analytical data: K = 6.644%, $*Ar^{40}$ = 0.03579 ppm. Dated by: Geochron Laboratories, Inc., for Refractory Metals Products Department, General Electric Co.; mineral separates prepared by: Geochron Laboratories. Collected by: J. V. Tingley.

8. Sutton quartz veins K-Ar (adularia) 72.0 ± 2.6 m.y.
Quartz-adularia veins with scheelite, veins cut scheelite-bearing tactite (W½NW¼SW¼ sec. 35, T. 34 N., R. 33 E.). Analytical data: K = 10.992%; $*Ar^{40}$ = 0.05762 ppm. Dated by: Geochron Laboratories, Inc., for Refractory Metals Products Department, General Electric Co.; mineral separates prepared by: Nevada Bureau of Mines and Geology. Collected by: J. V. Tingley.

9. Southwest stock K-Ar (biotite) 66.5 ± 2.5 m.y.
Biotite granodiorite (W½NW¼SE¼ sec. 35, T. 34 N., R. 33 E.; Pershing Co., NV). Analytical data: K = 5.986%; $*Ar^{40}$ = 0.02894 ppm. Dated by: Geochron Laboratories, Inc., for Refractory Metals Products Department, General Electric Co.; mineral separates prepared by: Nevada Bureau of Mines and Geology. Collected by: J. V. Tingley.

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