

Sr isotope initial ratios from hydrothermal vein deposits of fluorite and carbonates II: Deposits in the Zuni Mountains, New Mexico

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SR ISOTOPE INITIAL RATIOS FROM HYDROTHERMAL VEIN DEPOSITS OF FLUORITE AND CARBONATES II: DEPOSITS IN THE ZUNI MOUNTAINS, NEW MEXICO

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We report the $^{87}\text{Sr}/^{86}\text{Sr}$ ratios and total Sr content for six samples of hydrothermal vein fluorite and calcite from various fluorite deposits in the Zuni Mountains, New Mexico. These deposits are presumed to be Laramide or possibly mid-Tertiary in age; fluid inclusion studies (in preparation) indicate temperatures of homogenization of 200°C to 250°C.

The samples were analyzed by neutron activation analysis for Sr contents; reported values are precise to ± 5 percent of the reported values. The Omega West Reactor of the Los Alamos National Laboratory was used for the analyses. Rubidium in all samples was below detection; accepted as 10 ppm for the method used. Sr isotope analyses were carried out at the University of New Mexico by conventional mass spectrometry. Replicate runs of the Eimer and Amend SrCO_3 yielded $0.7080_3 \pm 0.0000_4$ (two sigma). M. S. Abashian and H. A. Vogler assisted with the analytical work.

DISCUSSION

The samples analyzed contain very high $^{87}\text{Sr}/^{86}\text{Sr}$ ratios and low total Sr abundance for five of the six samples. This is characteristic of other hydrothermal vein fluorite-carbonate deposits in the western United States investigated so far (Brookins and others, 1971; Brookins, 1982).

SAMPLE DESCRIPTIONS

1. **178-4-UNM-KTE-DGB**
Banded massive green fluorite; botryoidal on growth surfaces. Individual bands are 3-to-8 mm thick. (Section 27 Mine; center S 1/8 S27,T9N,R11W, 34°58'33"N, 107°58'19"W, Cibola Co., NM). Sr content = 8.0 ppm. *Collected by:* K. T. Emanuel; *data from:* Univ. New Mex. Geochronology Laboratory.
(fluorite) $^{87}\text{Sr}/^{86}\text{Sr}$ initial ratio = 0.7249
2. **178-4-UNM-KTE-DGB**
Coarsely crystalline brown calcite intergrown with green fluorite (Section 27 Mine; center S 1/8 S27,T9N,R11W, 34°58'33"N, 107°58'19"W, Cibola Co., NM). Sr content = 38 ppm. *Collected by:* K. T. Emanuel; *data from:* Univ. New Mex. Geochronology Laboratory.
(calcite + fluorite) $^{87}\text{Sr}/^{86}\text{Sr}$ initial ratio = 0.7535

3. **MirN-1-UNM-KTE-DGB**
Massive green fluorite as columnar, interlocking growths with octahedral cleavage. (Mirabel Mine, center NE¼ S7,T11N,R12W, 35°12'09"N, 108°08'19"W, Cibola Co., NM). Sr content = 26 ppm. *Collected by:* K. T. Emanuel; *data from:* Univ. New Mex. Geochronology Laboratory.
(fluorite) $^{87}\text{Sr}/^{86}\text{Sr}$ initial ratio = 0.7405
4. **10679-8G-UNM-KTE-DGB**
Banded greenish blue fluorite. (Boonekay Mine, center NE¼ S16,T9N,R11W, 35°00'43"N, 107°59'45"W, Cibola Co., NM). Sr content = 8.0 ppm. *Collected by:* K. T. Emanuel; *data from:* Univ. New Mex. Geochronology Laboratory.
(fluorite) $^{87}\text{Sr}/^{86}\text{Sr}$ initial ratio = 0.7478
5. **10679-7-UNM-KTE-DGB**
Cubic blue fluorite. Four-to-five mm cubes on edge as overgrowths on massive green fluorite. (Bonita Mine, T10N,R11W, 35°04'06"N, 108°00'32"W, Cibola Co., NM). Sr content = 172 ppm. *Collected by:* K. T. Emanuel; *data from:* Univ. New Mex. Geochronology Laboratory.
(fluorite) $^{87}\text{Sr}/^{86}\text{Sr}$ initial ratio = 0.7396
6. **62478-13-UNM-KTE-DGB**
Massive columnar intergrowths of blue fluorite with cubic fluorite. (Porter-Mirabel Mine, center S28,T9N,R11W, 34°59'01"N, 108°00'10"W, Cibola Co., NM). Sr content = 40 ppm (by atomic absorption spectrophotometry). *Collected by:* K. T. Emanuel; *data from:* Univ. New Mex. Geochronology Laboratory.
(fluorite) $^{87}\text{Sr}/^{86}\text{Sr}$ initial ratio = 0.7595

REFERENCES

- Brookins, D. G. (1982) Sr isotope initial ratios from hydrothermal vein deposits of fluorites and carbonates I: Deposits from Mineral County, Montana: Isochron/West, no. 33.
- Brookins, D. G., Metz, M. C., Rosenberg, P. E., and Zartman, R. E. (1971) Strontium geochemistry of some quartz-fluorite-carbonate veins from western Montana: Trans. Amer. Geophys. Union, v. 73, p. 364.

