A NEW DUMORTIERITE LOCALITY FROM MONTANA

CHARLES E. GRAHAM AND FORBES ROBERTSON*

The mineral dumortierite, a boron-aluminum-silicate, is reported for the first time in Montana. It is found in a foliated pegmatite in the Ruby Range, in secs. 3 and 4, T. 7 S., R. 6 W., about 14 miles east of Dillon, Montana, as shown on the index map.

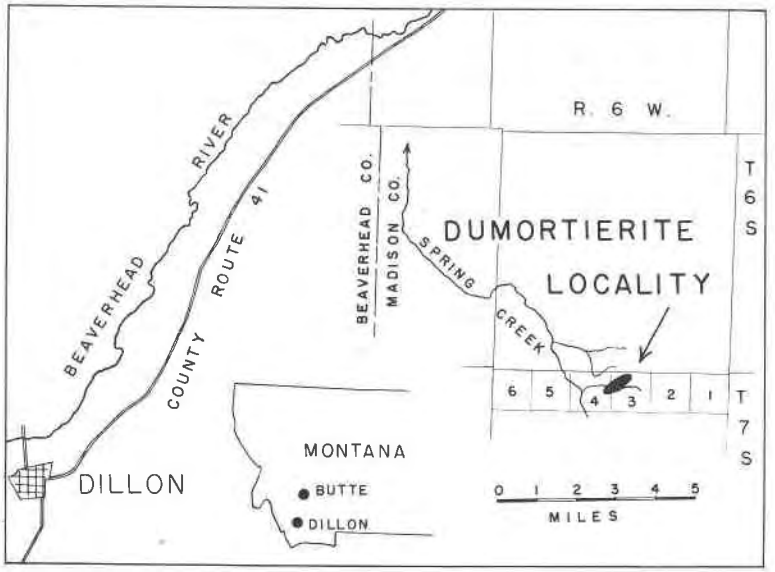

FIG. 1

The pegmatite occurs in the pre-Cambrian Pony series of schists and gneisses, and lies parallel to the foliation planes in the metamorphic rocks. It can be traced along the strike, intermittently, for more than 2500 feet in a N. 50°–65° E. direction, and has a maximum width of about 60 feet. The pegmatite is composed of microcline-microperthite, quartz, oligoclase, and muscovite. Black tourmaline and the royal blue dumortierite are found in quartz-rich pods or irregular vein-like bodies within the pegmatite. The boron minerals are sporadically distributed at several points along the strike and comprise several per cent of the rock, locally.

The physical properties of the Ruby Range dumortierite agree closely with previously published descriptions. They are as follows: crystals acicular to fine columnar with prominent longitudinal striations; twin-

* University of Iowa, Iowa City, Iowa, and Montana School of Mines, Butte, Montana.

ning on {110} with c the axis of rotation; distinct {100} cleavage; longitudinal and transverse partings, the basal parting making an angle with {001} of about $10° \pm 6°$; hardness 7; specific gravity about 3.25; infusible with loss of color on ignition; insoluble in acids.

The optical properties differ in some respects from those previously published. These properties are: optic plane is parallel to (010); $X = c$; twinning on {110} with the angle between adjacent optic planes 61° to 64°; $2V = 56°$; dispersion rather weak $v > r$; $n_\alpha = 1.661 \pm .001$, $n_\beta = 1.678 \pm .001$, $n_\gamma = 1.683$ (calculated); $n_\gamma - n_\alpha = .022$; strongly pleochroic, in thin section X = light steel blue, Y = Z = colorless; in fine grains X = brilliant blue, Y = Z = colorless to very faint yellow. Inclusions are very few including: rectangular colorless, minute irregular opaque, and very small dumortierite grains.

Qualitative spectrographic analysis indicates silicon, aluminum, and boron as the essential constituents in the silicate mineral. The boron doublet 2496.8, 2497.7 is conspicuous on the film. Titanium is present in an amount which suggests a minor essential element as is the case in the Nevada, California, and Washington (1, 2, 3) dumortierites. The titanium lines checked include 5036.5, 5025.6, 5014.2, 4991.1, and 4870.1. Copper is present in trace amounts, with lines 3273.9 and 3247.5 visible. Iron is a very minor impurity and may originate in the opaque inclusions. Other rock-forming constituents are absent.

Other minerals found with the blue dumortierite include a green variety of dumortierite which is strongly pleochroic in fine grains with X = brilliant apple green, blue-green, or yellow green, Y = Z = colorless. It is a conspicuous minor mineral which is intimately associated with the blue variety. The refringence is somewhat greater than the blue dumortierite, whereas 2V is smaller. Several other pleochroic minerals which are thought to be rather rare species of boron silicates have been recognized but not positively identified.

Acknowledgments and References

Qualitative spectrographic analysis by Wilbur O. Aikin, Montana School of Mines, Butte, Montana.

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