A ZIRCONIUM-BEARING GARNET FROM OKA, QUEBEC[1]

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During a mineralogical investigation in 1956 at the Mines Branch, Ottawa, of some diamond drill cores from the Oka property of Quebec Columbium Limited, a small amount of a zirconium-bearing garnet was observed by the writer (Nickel, 1956). The garnet occurred as anhedral grains up to 5 mm in diameter in rock consisting largely of calcite, nepheline and biotite, with minor amounts of diopside and apatite. The composition of the garnet is given in Table 1. The percentages shown, except for that of zirconium, were determined spectrographically by Dr. W. M. Gray of the Mines Branch.

Recently, in a re-examination of the material, a chemical determination of the zirconium content was made on a 45-mg sample of hand-picked garnet by Miss E. E. Lepine of the Mines Branch, using a colorimetric method. The value obtained, 3.7% ZrO_2, is lower than, but of the same order of magnitude as, the 5% Zr determined spectrographically and somewhat higher than a gravimetric chemical determination made at the time of the 1956 investigation.

TABLE 1. APPROXIMATE COMPOSITION OF ZIRCONIUM-BEARING GARNET

Element	Wt %	Oxide	Wt %
Ca	30	CaO	42
Si	15	SiO_2	32
Fe	10	Fe_2O_3	14
Ti	3	TiO_2	5
Mn	2	MnO	2.6
Al	2	Al_2O_3	3.8
Mg	0.6	MgO	1.0
Zr (chem.)	2.7	ZrO_2	3.7
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The garnet is black in colour, and thin splinters are dark brown in transmitted light. Some of the other properties of the mineral are given in Table 2, with those of andradite and kimzeyite listed for comparison.

The gross chemical composition of the garnet indicates that it can be classified as a variety of andradite, and its titanium content suggests that it could further be grouped under schorlomite, the titanium-rich andradite. The zirconium content is considerably below that of kimzeyite,

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a zirconium garnet from Magnet Cove, Ark., recently described by Milton & Blade (1958) and which contains about 20% ZrO_2. Like kimzeyite, however, the Oka garnet is high in calcium and iron and also contains appreciable titanium.

TABLE 2. PHYSICAL AND OPTICAL PROPERTIES OF ZIRCONIUM-BEARING GARNETS AND ANDRADITE

	Zirconium-bearing Garnet, Oka, Que.	Kimzeyite Magnet Cove, Ark.*	Andradite**
Refractive Index	1.94	1.95	1.887
Specific Gravity	3.70	—	3.859
Cell Edge (a)	12.15 Å	12.46 Å	12.05 Å

*Milton & Blade (1958).
(After submission of this communication, Dr. Charles Milton reported (personal communication) that further work on the kimzeyite from Magnet Cove has resulted in the following modifications of his previously published data: refractive index 1.94; specific gravity 4.0, and ZrO_2 content 29.9%.)
**Skinner (1956).

REFERENCES

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