

## TWO SAPPHIRINE LOCALITIES IN NEW QUEBEC

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### ABSTRACT

Two sapphire localities are reported in New Quebec, one near Cape Hopes Advance (1) and the other at Lake Sirmiq (2). These are associated with granulite and amphibolite (retrograded granulite) facies rocks. Microprobe analyses lead to the following structural formulae: (1)  $(Mg_{2.8}Fe^{2+}_{0.7})(Al_{4.3}Fe^{3+}_{0.2}Cr_{0.04})(Al_{4.4}Si_{1.6})O_{20}$ ; (2)  $(Mg_{3.2}Fe^{2+}_{0.5})(Al_{4.2}Fe^{3+}_{0.2}Cr_{0.01})(Al_{4.4}Si_{1.6})O_{20}$ .

**Keywords:** sapphire, New Quebec, granulite-facies rocks, Lake Sirmiq, Cape Hopes Advance.

### SOMMAIRE

Es deux endroits du nouveau Québec (cap Hopes Advance, lac Sirmiq), on signale la sapphire dans des roches de facies granulite ou amphibolite (granulite rétrograde). Les deux échantillons, analysés à la microsonde, ont donné: (1)  $(Mg_{2.8}Fe^{2+}_{0.7})(Al_{4.3}Fe^{3+}_{0.2}Cr_{0.04})(Al_{4.4}Si_{1.6})O_{20}$ ; (2)  $(Mg_{3.2}Fe^{2+}_{0.5})(Al_{4.2}Fe^{3+}_{0.2}Cr_{0.01})(Al_{4.4}Si_{1.6})O_{20}$ .

(Traduit par la Rédaction)

**Mots-clés:** sapphire, nouveau Québec, roches du facies granulite, lac Sirmiq, cap Hopes Advance.

Despite its prominent blue color, sapphire is rarely reported from the Canadian Shield. Higgins *et al.* (1979) listed only three occurrences. It has now been identified in rocks from two other localities, both in New Quebec.

Westra (1978) discovered sapphire in a suite of metamorphic rocks collected during a reconnaissance mapping project by the Geological Survey of Canada in 1973 (Taylor 1974). This sapphire, which occurs only in microscopic amounts, is from 7 km southwest of Cape Hopes Advance (Lat. 61°02'N, Long. 69°39'W). It is associated with spinel as small inclusions in garnet in an amphibolite-facies metamorphic rock retrograded from the granulite facies. Hornblende, biotite, quartz and plagioclase also are present. Westra gave results of a provisional electron-microprobe chemical analysis of the sapphire (Table 1).

During the same mapping project, a second and previously unreported occurrence of sapphire was sampled by J.B. Henderson on the northeast shore of Lac Sirmiq (Lat. 62°14'N,

TABLE 1. MICROPROBE ANALYSES OF SAPPHIRINE

	<u>1</u>	<u>2</u>
SiO <sub>2</sub>	12.80	13.89
TiO <sub>2</sub>	-	0.03
Al <sub>2</sub> O <sub>3</sub>	60.60	60.94
MgO	15.20	17.82
FeO	8.70	7.53
MnO	-	0.02
Cr <sub>2</sub> O <sub>3</sub>	0.45	0.11
total	97.75	100.34
IV		
Si	1.56	1.64
Al	4.44	4.36
VI <sup>3+</sup>		
Al	4.31	4.16
Fe	0.17	0.21
Cr	0.04	0.01
VI <sup>2+</sup>		
Mg	2.77	3.15
Fe	0.72	0.53
total	14.01	14.06

1. Cape Hopes Advance (Westra 1978).
2. Lac Sirmiq (M. Bonardi, analyst).

Long. 76°35'W). There, megascopic amounts of sapphire, with some grains up to 2 cm long, are associated and intergrown with hypersthene, biotite, plagioclase and quartz. This fresh rock is in the granulite metamorphic facies. Seven electron-microprobe analyses, three each of cores and edges of large grains and one of a small grain, show similar composition throughout. An average of these 7 analyses is shown in Table 1.

In addition to the results of microprobe analyses, Table 1 shows the structural formulae based on 20 oxygens and assumptions of cation occupancy of 14 sites, charge balance and stoichiometry following the method of Higgins *et al.* (1979).

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