Report on a Chromite Prospect (105-C-5)

by

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Introduction

A visit was made on July 29, 1979 with Gordon McLeod to his chromite prospect on map sheet 105-C-5, approximately 3 miles due north of the north end of Dalayee Lake. According to Mulligan's (1963) geological map, the chromite occurs whithin unit 11, a unit consisting of peridotite, pyroxenite, and serpentine of Jurassic or Cretaceous age. More recent papers on the tectonics of the Cordillera (Monger and Price, 1979; Tempelman-Kluit, 1979) suggest that the ultramafic rocks are of Carboniferous age and were thrust allochthonously into their present locations during the Triassic-Jurassic. Results of this thrust faulting have placed the ultramafics on top of a variety of rock units.

General Geology

The chromite showing is located within the ultramafic mass. Below the chromite, in the lower portion of the body, the ultramafic is altered to an assemblage of talc-chlorite-dolomite-siderite and an apple green mineral. This apple-green mineral, which is most likely the nickel bearing serpentine garnierite, is quite abundant. The altered ultramafic grades into reasonably fresh and massive peridotite and it is immediately after this transition that the chromite occurrence is found. The peridotite has been serpentinized in places but where fresh, mineral layering is well-preserved. Overlying the peridotite are mafic volcanics; the contact trends 100°/20°S.

Economic Geology

The chromite occurs in a small (4' x 5' approx.) pod-like mass which dips into the hill-side. The chromite is "grape ore", formed of orbicular crystals ranging from .5 to 2.5 mm in size. The interstitial

material, which accounts for only 10% of the rock, is primarily talc with minute millerite (NiS) crystals. The texture suggests that the chromite was precipitated from the ultramfic magma during crystallization. This type of crystallization, along with evidence for somewhat extensive mineral layering in other portions of the ultramafic, suggests that there is some hope for lateral continuity to the chromite. Historically however, "podiform chromite" is truly pod-like and lateral continuity has not been common.

Attached to this report are copies of various assays that have been obtained on the chromite material at several different times. The results of the microprobe analysis is considered to be more representative of the chromite since it is done on a spot and does not include any of the interstitial material that is inevitably assayed along with the chromite. Metallurgical grade chromite has a high chrome content (45-56% Cr_2O_3) and a high Cr:Fe ratio (2.5-4.3). The microprobe analysis of this chromite shows the Cr_2O_3 content to be 49.4% and the Cr:Fe ratio 3.4. This sample is therefore a very good grade metallurgical chromite.

The main problem with this showing is the small area of actual chromite that outcrops. The lateral and down-dip extent of the chromite should be determined, either by drilling or trenching across the face of the outcrop. However, 'podiform chromite' deposits tend to be irregularly shaped, small, randomly distributed and often highly deformed. The deformation of this ultramafic body was not examined in detail, but apart from the basal zone already described, the upper portion of the body does not seem to be extensively deformed. This should increase the chance of successfully outlining the shape of the chromite pod. The presence of one chromite pod suggests that there should be others associated with the ultramafics (there is one other known chromite showing in the Michie Lake area, 105-D-9).

References:

Monger, J.W.H and Price, R.A., 1979; Geodynamic Evolution of the Canadian Cordillera - Progress and Problems. Can. Jour. Earth Sci., 16, pp. 770-791.

Mulligan, R., 1963; Geology of the Teslin Map-Area, Yukon Territory, Geol. Surv. Canada, Memoir 326, 96 p.

Tempelman-Kluit, D.J., 1979; Five Occurrences of Transported Synorogenic Clastic Rocks in Yukon Territory, Geol. Surv. Canada, Paper 79-1A, pp. 1-12.

Appendix: Assays Attached.

Addendum to Report

Microprobe analyses were made to verify whether the brilliant apple green mineral observed over a wide area and associated with the chromite bearing ultramafic rock was garnierite. Probe analysis of the mineral (analysis attached) indicates that the mineral is Fuchsite, the chrome-bearing mica. While the length of stratigraphic section over which the fuchsite is found was not measured, the thickness is considerable, indicating a wide zone of chrome enrichment. This zone is probably the best target area for other chromite zones. The distribution of fuchsite should be mapped in order to outline areas for detailed prospecting and geophysics.

CHROMITE PROSPECT

MAP SHEET 105-C-5

Coexisting minerals from brilliant green altered ultramafic rock above the chromite zone.

	MAGNESITE			DOLOMITE	
	1	2	3	4	5
MgO	40.40	39.16	43.23	19.74	21.07
CaO	0.33	0.16	0.10	27.75	28.96
MnO	0.25	0.54	0.25	1.43	0.45
FeO	9.69	10.22	5.76	2.18	1.08
CO_2	49.33	49.91	50.67	48.90	48.44

RUTILE		FUCHSITE		PYRITE	
SiO_2	1.21	Na_2O	0.36	S	53.40
TiO_2	93.27	MgO	3.30	Fe	44.77
Cr_2O_3	2.73	Al_2O_3	26.26		
	0.00	SiO_2	47.20	TOTAL	98.17
		K_2O	9.13		
TOTAL	97.21	CaO	0.02		
		Cr_2O_3	7.18		
		MnO	0.41		
		FeO	0.39		
		BaO	0.56		
			0.00		
		TOTAL	94.81		

Microprobe Analyses of Minerals by Energy Dispersive techniques at Ecole Polytechnique, Montreal.

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Your file Votre référence

Our file Notre référence

Chromite Analysis
Map Sheet 105-C-5

ELEMENT	PERCENT
Al_2O_3	19.9
Cr_2O_3	49.4
Fe_2O_3	14.0
MgO	16.6
	99.9 %

In addition, interstitial to the chromite there is talc containing the nickel sulphide millerite in very small grains. (millerite - 63% Ni 37% S)

Chromite analysis by energy dispersive microprobe analysis