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CANADA

DEPARTMENT OF MINES AND TECHNICAL SURVEYS

OTTAWA

MINES BRANCH INVESTIGATION REPORT IR 60-103

**CONCENTRATION OF MAGNETITE FROM A
SAMPLE OF SANDS SENT BY
J. E. ROCHON, LOW, QUEBEC**

by

R. S. KINASEVICH

MINERAL PROCESSING DIVISION

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COPY NO. 7

OCTOBER 11, 1960

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CONCENTRATION OF MAGNETITE FROM A SAMPLE
OF SANDS SENT BY J. E. ROCHON, LOW, QUEBEC

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R. S. Kinasevich *

SUMMARY OF RESULTS

A sample of the sands, assaying 4.3% iron and 0.64% titanium, was crushed to all -10 mesh and treated on the Ball-Norton magnetic separator. This treatment gave a 60.4% iron concentrate in which 30.4% of the iron was recovered. The ratio of concentration was 43 to 1.

From a separate lot, consisting of several pieces of lump rock, one piece was selected for a spectrographic analysis. As the latter indicated the presence of only 5% iron, no test work was done on this shipment.

* Scientific Officer, Mineral Processing Division, Mines Branch, Department of Mines and Technical Surveys, Ottawa, Canada.

INTRODUCTION

Shipment

On August 29, 1960, a shipment of sands, weighing 50 lb, was sent to the Mines Branch laboratories by Mr. J. E. Rochon, R. R. 1, Low, Gatineau County, P.Q.

A separate lot consisting of several lumps of rock was personally submitted by Mr. Rochon on September 16, 1960, at which time he requested an analysis for iron content.

Location of Property

The exact locations from which either of the two shipments was taken are not known, except that both originated from Gatineau County, P.Q.

Purpose of Investigation

Mr. Rochon requested that the magnetite in the sands be concentrated in order to determine the value of the deposit. Regarding the second shipment, Mr. Rochon agreed to have a representative piece chosen and spectrographically analyzed before any decision be made to do test work on this lot.

Sampling and Analysis

From the 50 lb lot of sands, a head sample was sent for chemical and spectrographic analysis.

The head sample assayed 4.30% soluble iron while the spectrographic analysis detected the following elements in order of decreasing abundance:

- I Si, principal constituent
- II Fe, Al, Ca, Na, Mg
- III Ti, Mn
- IV Ba, Zr, Ni, Cr, Cu
- V V, Co, Be, Sr

What appeared to be the richest lump of the second lot, had the following spectrographic analysis:

- I Si - principal constituent
- II Al, Fe(5%), Na, Mg
- III Ca, Ti(0.4%), Mn
- IV Ba, Cr, Cu(0.02%), Zr, Ni
- V V, Co, Be

Neither of the samples was sent for mineralogical examination.

DETAILS OF INVESTIGATION

1. Ball-Norton Concentration of the Magnetite

A sample of the sands was screened through a 10-mesh screen, and the oversize reduced to the same size. After being passed through the Ball-Norton magnetic separator, the results given in Table 1 were obtained:

TABLE 1

Results of Ball-Norton Magnetic Concentration

Product	Weight, grams	Weight, %	Assay, %		Distribution of Iron %
			Soluble Iron	Titanium	
Conc Tailing	61.0	2.3	60.4	0.61	30.4
	2582.	97.7	3.25	1.10	69.6
Calc'd Head	2643	100.0	4.57	0.63	100.0

CONCLUSIONS AND DISCUSSION

Although the grade of iron in the concentrate is attractive, the titanium content is in excess of the usual acceptable 0.1%. The recovery of 30.4% of the iron is much too low. Furthermore, with just a preliminary crushing stage, one could expect to obtain only one ton of concentrate from over 40 tons of sand. The exploitation of such a low-grade deposit would not be economic unless a large tonnage existed and costs of mining and treatment were such that a profit would be yielded from the price to be expected for a 60% iron concentrate.

RSK:jm