MAR 19490001: CROWSNEST PASS

Received date: Apr 30, 1949

Public release date: Apr 30, 1950

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O T T A W A April 30th, 1941.

R E P O R T

of the

ORE DRESSING AND METALLURGICAL LABORATORIES.

Investigation No. MD995.

Magnetic Concentration and Microscopic Examination of Iron-Bearing Materiel from the Burmis Titaniferous Iron Deposit, Crow's Nest Pass, Alberta.

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(Copy No. 24.)

NOTE

This report relates essentially to the samples as received. It shall not, nor any correspondence connected therewith, be used in part or in full as publicity or advertising matter for the sale of shares in any promotion.

CANADA
DEPARTMENT OF MINES AND RESOURCES
MINES AND GEOLOGY BRANCH
BUREAU OF MINES

O T T A W A April 30th, 1941.

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ORE DRESSING AND METALLURGICAL LABORATORIES.

Investigation No. 995.

Magnetic Concentration and Microscopic Examination of Iron-Bearing Material from the Burmis Titaniferous Iron Deposit, Crow's Nest Pass, Alberta.

Shipment:

Four small samples, namely, No. 6, weighing 230 grams; No. 7, 900 grams; No. 18, 150 grams; and No. 19, 440 grams; were received on January 17th, 1941, from Mr. N. H. C. Fraser, of Ventures Limited, 2810 - 25 King Street West, Toronto, Ontario.

Location of the Property:

The Burmis iron deposits, from which the present samples were taken, are situated adjacent to Burmis station, on the Crow's Nest branch of the Canadian Pacific Railway, nine miles east of Blairmore, in the province of Alberta.

Sampling and Analysis:

After crushing, cutting, and grinding by standard methods, portions of each sample were obtained which were assayed for iron and titanium.

Results of chemical analysis -

Sample No.	Iron, per cent	Titanium, per cent
6.	16.68	0.91
7.	53.42	4.26
18.	23.24	2.68
19.	51.64	3.83

Characteristics of the Ore:

Six polished sections were prepared from the four samples, as follows:

Sample No. 6 - 1 section.
" " 7 - 2 sections.
" " 18 - 1 section.
" " 19 - 2 sections.

The polished sections were examined microscopically for the purpose of determining the modes of occurrence of the iron and titanium known to be present in the deposit.

Gangue -

The gangue consists essentially of two constituents, namely, quartz grains and carbonate matrix. The quartz is even-textured and medium- to fine-grained; the individual grains show effects of attack by the carbonate matrix which

(Characteristics of the Ore, cont'd) -

cements them and are usually somewhat irregular and indented in outline. Occasionally, however, a grain which has not been attacked by the carbonate may be seen, and such grains exhibit a rounded outline, indicating sedimentary origin.

Metallic Minerals -

Magnetite is the only abundant metallic mineral, its quantity varying greatly in the different samples. The grains are irregular in shape, vary from several hundred microns to only a few microns in size, and occur in the matrix in a manner similar to the quartz grains. No ilmenite is present within the magnetite and none was detected in the gangue.

A light grey, moderately anisotropic mineral occurs as sparingly scattered grains associated with the magnetite in the gangue. While this mineral could not be identified definitely, it is thought that it may be either rutile or titanite, and may account for the titanium present in the deposit. It occurs in grain sizes and relationships similar to the magnetite.

"Limonite" occurs locally in the matrix, but the total quantity is small.

Pyrite is rare. It occurs in Sample No. 18 as tiny grains in the carbonate matrix. This sample likewise contains more limonite than the others.

Distribution of the magnetite in the samples;

Sections from Samples Nos. 6 and 18 are quite similar, consisting largely of gangue with a very minor quantity of magnetite. Those from Samples Nos. 7 and 19 show minor gangue with abundant magnetite.

Investigation Work:

It was desired, by Mr. Fraser, to ascertain whether a magnetic separation of the iron and titanium minerals in the ore was feasible.

This procedure was attempted by the use of a Davis "Magnetic Tube" concentrator. This machine is designed to perform satisfactorily on ore containing strongly magnetic material when crushed to minus 100 mesh.

The ore was crushed and a weighed portion fed to the machine. After 10 minutes' operation, a magnetic concentrate and a non-magnetic tailing were obtained. These products were assayed for iron and titanium. Two portions from each ore sample were subjected to this treatment, the first lot at minus 100 mesh, and a second at minus 200 mesh.

Results of Test Work:

On Sample No. 6.

At minus 100 mesh.

Product	Weight, per cent	Assays, per cent Fe	Assays, per cent Ti	Distribution, per cent Fe	Distribution, per cent Ti
Feed	100.00	16.67⊕	1.14⊕	100.0	100.0
Conc.	7.00	61.37	0.89	25.8	5.4
Tailing	93.00	13.31	1.16	74.2	94.6

At minus 200 mesh.

Feed	100.00	16.68	0.91	100.0	100.0
Conc.	7.00	62.36	0.84	26.2	6.5
Tailing	93.00	13.24⊕	0.91⊕	73.8	93.5

⊕ Calculated.

(Continued on next page)

(Magnetic Concentration Results, cont'd) -

On Sample No. 7.

At minus 100 mesh.

Product	Weight, per cent	Assays, per cent Fe	Assays, per cent Ti	Distribution, per cent Fe	Distribution, per cent Ti
Feed	100.00	53.49@	5.44@	100.0	100.0
Conc.	71.00	64.55	1.88	85.7	24.5
Tailing	29.00	26.41	14.17	14.3	75.5

At minus 200 mesh.

Feed	100.00	53.42	4.26	100.0	100.0
Conc.	68.00	66.53	1.52	84.7	24.2
Tailing	34.00	24.05@	13.42@	15.3	75.8

On Sample No. 18.

At minus 100 mesh.

Feed	100.00	22.47@	2.46@	100.0	100.0
Conc.	19.00	62.36	1.28	52.7	9.9
Tailing	81.00	13.11	2.74	47.3	90.1

At minus 200 mesh.

Feed	100.00	23.24	2.68	100.0	100.0
Conc.	19.00	64.35	1.16	52.6	8.2
Tailing	81.00	13.59@	3.04@	47.4	91.8

On Sample No. 19.

At minus 100 mesh.

Feed	100.00	51.95@	4.51@	100.0	100.0
Conc.	77.00	60.77	2.74	90.1	46.7
Tailing	23.00	22.44	10.46	9.9	53.3

At minus 200 mesh.

Feed	100.00	51.64	3.83	100.0	100.0
Conc.	70.00	64.35	2.25	87.2	41.1
Tailing	30.00	22.00@	7.52@	12.8	58.9

@ Calculated.

Summary and Conclusions:

The test work on the different samples gave the best results on Sample No. 7, where a magnetic concentrate assaying 64.5 per cent iron and 1.9 per cent titanium was obtained from the minus 100 mesh material and a magnetic concentrate assaying 66.5 per cent iron and 1.5 per cent titanium from the minus 200 mesh size. These concentrates contained 85 per cent of the iron and 24 per cent of the titanium in the feed sample.

These results indicate that a partial separation of the iron and titanium minerals is possible when the material is finely ground. If a larger-sized sample is obtainable, possibly these results could be improved upon by further test work.

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