

# FILE COPY

O T T A W A

July 27th, 1940.

R E P O R T

of the

ORE DRESSING AND METALLURGICAL LABORATORIES.

Investigation No. 878.

Concentration of a Molybdenite  
Ore from Gayhurst Township,  
Frontenac County, Quebec.

-----

CANADA

Bureau of Mines  
Division of Metallic  
Minerals

DEPARTMENT  
OF  
MINES AND RESOURCES

Mines and Geology Branch

O T T A W A

July 27th, 1940.

R E P O R T

of the

ORE DRESSING AND METALLURGICAL LABORATORIES

Investigation No. 878.

Concentration of a Molybdenite  
Ore from Gayhurst Township,  
Frontenac County, Quebec.

Shipment:

A small parcel containing 15 pounds of  
Molybdenite ore was received on May 30th, 1940, from  
Henri LeRoy, Lac Megantic, Quebec.



Location of the Property:

The property from which the sample was taken is situated on Range IX, Lots 16-18, Gayhurst township, Frontenac county, Quebec.

Sampling and Analysis:

After cutting and crushing by standard methods, a representative sample was obtained which assayed:-

MoS <sub>2</sub>	-	3.74	per cent
Cu	-	0.40	" "
Fe	-	31.23	" "

Characteristics of the Ore:

Six polished sections were prepared and examined under the reflecting microscope for the purpose of determining the character of the ore.

Gangue -

The gangue consists of glassy iron-stained quartz, which is slightly fractured and transected by narrow sinuous cracks.

Metallic Minerals -

Metallic mineralization is heavy and forms the greater proportion of the sections. Pyrrhotite preponderates, largely as coarse-textured masses; a small amount also occurs as disseminated grains and discontinuous stringers in gangue. It is replaced along fine hair-like cracks and around grain boundaries by "limonite", pyrite, and marcasite (?), and is very intimately associated with the other sulphides.

(continued on next page)



Two types of pyrite, the next most abundant opaque mineral, are present, namely, (a) coarse disseminated grains, and (b) concentric colloform structures which appear to have attacked and replaced type (a) and pyrrhotite.

A considerable quantity of molybdenite occurs in gangue and in sulphides as disseminated grains and long prismatic sections medium to very fine in size. The ore is extensively oxidized and "limonite" is prevalent as replacement veins and margins in and around sulphides, particularly pyrrhotite. A small amount of chalcopyrite is visible as medium to fine irregular grains associated with the other metallics. Along some pyrite veins in pyrrhotite there are narrow bands of an alteration product which appears to be marcasite(?); its total amount is very small.

Conclusion from Microscopic Examination -

This ore will require fine grinding to liberate the molybdenite owing to its finely divided condition. Since this mineral is intimately intergrown with pyrrhotite, it is doubtful if this operation can be economically carried far enough to obtain a satisfactory iron-free concentrate.

Investigative Test Work:

An attempt was made to concentrate the molybdenite by flotation. Owing to the large percentage of pyrrhotite and pyrite in the sample it was not possible to determine a method with the limited amount of ore at the disposal of the operator.

The tests are described in detail as follows:

(Continued on next page)



Test No. 1.

The ore at minus 14 mesh was ground to pass 51 per cent minus 200 mesh with 0.5 lb. of coal oil per ton. The pulp was then transferred to a Denver flotation machine and a molybdenite concentrate obtained by the addition of 0.05 lb. of pine oil per ton. This concentrate was then transferred to a smaller flotation machine and a cleaner concentrate secured.

Results of Concentration:

Product	Weight : per cent	Assay, : MoS <sub>2</sub> : per cent	Distribution: : of MoS <sub>2</sub> , : per cent	Ratio of : Concentration
Feed	: 100.00	3.65*	100.0	
Conc.	: 6.60	38.63	69.8	15:1.
Midd.	: 14.24	7.07	27.6	
Tailing	: 79.16	0.12	2.6	

\* Calculated.

The concentrate assayed 30 per cent Fe.

---

Test No. 2.

In this test the ore was ground with 0.1 lb. coal oil and 0.2 lb. sodium silicate per ton, to pass 51 per cent minus 200 mesh. The primary flotation was similar to Test No.1. The cleaner concentrate was passed through an 80-mesh screen giving plus and minus 80 mesh products.

(continued on next page)

(Test No. 2, cont'd) -

Results:

Product	Weight, per cent	Assay, MoS <sub>2</sub> per cent	Distribution of MoS <sub>2</sub> , per cent	Ratio of Con- centration
Feed	100.00	3.65*	100.0	
+80 mesh Conc.	1.40	46.32	17.8	71.4:1.
-80 " "	5.65	37.06	57.4	17.7:1.
Middling	7.02	10.00	19.2	14.3:1.
Tailing	85.93	0.24	5.6	

\*Calculated.

Test No. 3.

This test was similar to Test No. 2, except that the ore was ground to 85.7 per cent minus 200 mesh, prior to flotation.

Results:

Product	Weight per cent	Assay, MoS <sub>2</sub> per cent	Distribution of MoS <sub>2</sub> per cent	Ratio of Concentration
Feed	100.00	4.29*	100.0	
+80 mesh Conc.	3.20	31.50	23.5	31:1.
-80 " "	9.79	24.04	54.8	10.2:1.
Middling	16.04	4.66	17.4	
Tailing	70.97	0.26	4.3	

\* Calculated.



Summary and Conclusions:

In the limited amount of work permitted by the sparseness of the sample, the highest grade of molybdenite concentrate produced assayed 46.3 per cent  $\text{MoS}_2$ . Fine grinding was not successful in raising the grade of concentrate. Owing to the intimate intergrowth of the molybdenite with the pyrrhotite, a separation of the two minerals was not shown to be feasible.

ooooooooo  
ooooo  
o

HLB:PES.