

O T T A W A

November 14th, 1940.

R E P O R T

of the


ORE DRESSING AND METALLURGICAL LABORATORIES.

Investigation No. 917.

Flotation of Cobalt and Nickel Assay  
Rejects from H. Davis, Cobalt, Ontario.

1940-11-14

BUREAU OF MINES  
DIVISION OF METALLIC MINERALS  
—  
ORE DRESSING AND  
METALLURGICAL LABORATORIES

  
CANADA  
DEPARTMENT  
OF  
MINES AND RESOURCES  
MINES AND GEOLOGY BRANCH

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Shipment:

The shipment, consisting of a number of finely ground samples of ore, was received from H. Davis, Cobalt, Ontario, on November 1st, 1940. The net weight of the combined sample was  $17\frac{5}{4}$  pounds.

Purpose of the Investigation:

The shipment was submitted for the purpose of determining the recovery of values by flotation.

Character of the Ore:

The ore in the various samples had been ground to approximately 100 mesh. The portions received were the assay rejects from previous sampling and assaying operations. The crushed ore varied in colour from dark grey to white.

Sampling and Analysis:

After mixing the samples thoroughly a portion was cut out and was found to contain:

Gold	-	0.32	oz./ton
Silver	-	0.97	"
Cobalt	-	1.85	per cent
Nickel	-	4.65	"

Investigative Procedure:

Two flotation tests were made using different reagents.

The products were a cleaner concentrate, a cleaner tailing and a flotation tailing from each test.

Results:

The cleaner concentrate contained:

	<u>Assay</u>	<u>Recovery, per cent</u>
Au,	1.06 oz./ton	93.8
Ag,	2.92 "	92.4
Co,	5.82 per cent	91.6
Ni,	16.42 "	97.4

Details of the Investigative Tests:

Test No. 1. - Flotation.

A sample of the assay rejects was charged into a flotation machine and agitated with 4.0 pounds soda ash per ton for 15 minutes.

Then 0.2 pound of amyl xanthate per ton was added and conditioned for 3 minutes. After adding 0.1 pound of pine oil per ton, a concentrate was removed. Two additions of amyl xanthate were made, consisting of 0.2 pound and 0.1 pound per ton with pine oil as required. The total additions of reagents were 0.5 pound of amyl xanthate and 0.25 pound of pine oil per ton.

The concentrate was cleaned by refloating it without the addition of reagents.

Results:

Product	Weight, per cent	A s s a y s				Distribution, per cent				Ratio of concen- tration
		oz./ton	per cent	per cent	per cent	per cent	per cent	per cent	per cent	
		Au	Ag	Co	Ni	Au	Ag	Co	Ni	
Feed <sup>®</sup>	100.0	0.31	0.87	1.76	4.66	100.0	100.0	100.0	100.0	
Cleaner conc.	27.6	1.06	2.92	5.82	16.42	93.8	92.4	91.6	97.4	3.62:1.
Cleaner tailing:	9.1	0.04	0.24	0.66	0.80	1.2	2.5	3.4	1.5	11:1.
Flot. tailing:	63.3	0.025	0.07	0.14	0.08	5.0	5.1	5.0	1.1	

<sup>®</sup> Calculated assays from the products of the test.

Test No. 2. - Flotation.

A sample of the assay rejects was charged into a flotation machine and conditioned for 15 minutes with

(Test No. 2, cont'd) -

4.0 pounds of soda ash and 0.5 pound of Barrett's No. 4 reagent per ton.

After adding 0.4 pound of amyl xanthate per ton in stages with 0.15 pound of pine oil per ton, a concentrate was recovered which was cleaned.

Results:

Product	Assays				Distribution,				Ratio of
	Weight, per cent	oz./ton	per cent	per cent	per cent	per cent	per cent	per cent	
		Au	Ag	Co	Ni	Au	Ag	Co	Ni
Feed <sup>①</sup>	100.0	0.26	0.81	1.65	4.80	100.0	100.0	100.0	100.0
Cleaner									
conc.	23.7	1.02	3.10	5.89	18.89	91.8	90.2	84.7	93.3
Cleaner									
tailing	14.1	0.11	0.35	1.13	1.88	5.9	6.0	9.6	5.5
Flot.									
tailing	62.2	0.01	0.05	0.15	0.09	2.3	3.8	5.7	1.2

<sup>①</sup> Calculated assays from the products of the test.

The results indicate the recovery and grade of concentrate which may be expected from ore of similar grade and character.

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