DIVISION OF
ORE DRESSING AND
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Ottawa, Ontario.
August 7th, 1929.

REPORT

of the

ORE DRESSING AND METALLURGICAL LABORATORIES

Concentration of Copper Ore From Arno Mines Limited, Coxheath, Nova Scotia.

By G.B. O'Malley.

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REPORT

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ORE DRESSING AND METALLURGICAL LABORATORIES

Report No. 331

Concentration of Copper Ore from Arno Mines Ltd, Coxheath, Nova Scotia.

By O. B. O'Malley

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Shipment: A shipment of 380 lbs. of ore was received on May 21, 1929 from Arno Mines Ltd, Coxheath, N.S. The shipment consisted of two lots, No. 1, 250 lbs. of newly broken ore, Lot 2, 130 lbs. of dumped material from the preliminary mine workings.

Characteristics of the Ore: The ore consists of massive chalcopyrite with pyrite in a siliceous gangue. There are small gold and silver values. Sample No. 2 contains a certain amount of partly oxidized sulphides.

Analyses of Sample:

	No. 1	No. 2
Copper	4.89 %	5.84 %
Gold	0.01 oz/ton.	0.03 oz/ton.
Silver	0.72 oz/ton.	0.62 oz/ton.
Iron	8.63 %	6.16 %
Sulphur	8.62 %	-
Insolubles	77.98 %	61.92 %

Experimental Tests: Batch flotation tests on 2000 gms. samples gave results as follows:

Sample No. 1

Test No.	Product	Weight Per cent	Assays Cu Per cent	Assays Au oz/ton	Assays Ag oz/ton	Per cent of Values Cu Per cent	Per cent of Values Au Per cent	Per cent of Values Ag Per cent
1	Concentrate	18.2	26.40	0.04	3.44	94.4	81.0	72.8
	Tailing	81.8	0.35	Tr.	0.18	5.6	19.0	27.2

Reagents: Soda ash 5.0; sodium cyanide 0.15; thiocarbanalid 0.1 lb/ton to ball mill; Pine oil 0.06 lb/ton to cell.

Test No.	Product	Weight Per cent	Assays Cu Per cent	Assays Au oz/ton	Assays Ag oz/ton	Per cent of Values Cu Per cent	Per cent of Values Au Per cent	Per cent of Values Ag Per cent
2	Concentrate	28.0	17.05	0.02	2.86	98.8	56.0	96.2
	Tailing	72.0	0.08	Tr.	0.04	1.2	44.0	3.8
	+65 mesh	0.8	0.22	Tr.	0.09	2.2	-	1.6
	+100	1.6	0.14	Tr.	0.06	2.8	-	2.1
	+150	1.3	0.16	Tr.	0.10	2.6	-	2.9
	+200	7.1	0.15	Tr.	0.09	13.5	-	14.2
	-200	89.2	0.07	Tr.	0.04	78.8	-	79.2

Reagents: Lime 5.0; thiocarbanalid 0.1 lb/ton to ball mill; potassium xanthate 0.1; Pine oil 0.06 lb/ton to cell.

Sample No. 1

Test No.	Product	Weight Per cent	Assays			Per cent of Values		
			Cu Per cent	Au oz/ton	Ag oz/ton	Cu Per cent	Au Per cent	Ag Per cent
3	Concentrate	16.6	27.95	-	-	96.2	-	-
	Middling	7.9	1.79	-	-	2.9	-	-
	Tailing	75.5	0.06	-	-	0.9	-	-

Reagents: Lime 5.0 lb/ton to ball mill; potassium xanthate 0.2; Pine oil 0.06 lb/ton. to cell.

Test No.	Product	Weight Per cent	Assays			Per cent of Values		
			Cu Per cent	Au oz/ton	Ag oz/ton	Cu Per cent	Au Per cent	Ag Per cent
4	Concentrate	20.3.	23.25	-	-	98.7	-	-
	Tailing	79.7	0.08	-	-	1.3	-	-

Reagents: Lime 5.0 lb/ton to ball mill; barnac 0.18; frothing agent B.F. #1 0.12 lb/ton. to cell.

Sample No. 2

Test No.	Product	Weight Per cent	Assays			Per cent of Values		
			Cu Per cent	Au oz/ton	Ag oz/ton	Cu Per cent	Au Per cent	Ag Per cent
5	Concentrate	18.1	29.62	-	-	95.8	-	-
	Middling	4.3	2.19	-	-	1.7	-	-
	Tailing	77.6	0.18	-	-	2.5	-	-

Reagents: Lime 8.0 lb/ton to ball mill; amyl xanthate 0.1; Pine oil 0.06 lb/ton. to cell.

Summary: Owing to the simplicity of the ore and the small amount of pyrite, there is no difficulty in obtaining excellent extraction of the copper contents in a high grade concentrate, whilst the recoveries of the small silver and gold values are sufficiently good. The somewhat higher recovery of gold by means of the soda ash circuit is not enough to justify the greater reagent cost as compared with the lime circuit using potassium xanthate and pine oil.

The test in which barmac was used indicates that this reagent gives good results with this type of ore.

The test on the oxidized ore shows that sulphidizing is not necessary, and the treatment of the dumped material need be no different in essentials from that of the newly mined ore.