

O T T A W A

February 22nd, 1944.

IR 1602

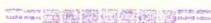
R E P O R T

of the

ORE DRESSING AND METALLURGICAL LABORATORIES.

Investigation No. 1602.

Flotation Tests Using a Sample of Technical  
Secondary Octyl Alcohol to Determine its  
Usefulness as a Flotation Reagent.



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Shipment:

A small bottle of technical secondary octyl alcohol was received on December 13th, 1943. The sample was submitted by Messrs. A. Boake, Roberts & Co. Ltd., Carpenters Road, Stratford, London E 15, England.

EXPERIMENTAL TEST WORK.

Flotation tests were conducted on two samples of ore in which the octyl alcohol was used as a frother. A series of tests was conducted on a copper ore consisting of massive and disseminated chalcopyrite in a white quartz gangue, while a second series was conducted on a siliceous ore containing carbonates and gold-bearing pyrite.

The first series, Tests Nos. 1 to 3, was conducted on the copper ore and the second series, Tests Nos. 4 to 6, on the pyrite ore. The results of these tests show that this



(Experimental Test Work, cont'd) -

sample of octyl alcohol is fairly satisfactory as a frothing oil.

Details of Tests:

Test No. 1.

A sample of the copper ore was ground 50 to 60 per cent through 200 mesh with 2.0 pounds of lime per ton added to the charge. The pulp was then conditioned for 5 minutes with 0.10 pound of amyl xanthate per ton and floated for 7 minutes with 0.108 pound of secondary octyl alcohol per ton. The products were assayed for gold. A large amount of dirty froth was produced in this test.

Results of Test No. 1:

Product	Weight, per cent		Assays, per cent		Distribution, per cent	
			Cu	S	Cu	S
Concentrate	15.55		12.34	10.46	93.04	93.68
Tailing	84.45		0.17	0.13	6.96	6.32
Feed (cal.)	100.00		2.06	1.74	100.00	100.00

Test No. 2.

A sample of the ore was given the same grind as in test No. 1, with the lime reduced to 1.0 pound per ton. The pulp was conditioned with 0.10 pound amyl xanthate per ton for 5 minutes and floated for 7 minutes with 0.072 pound secondary octyl alcohol per ton. The concentrate produced in this test was cleaner looking and less voluminous than that produced in Test No. 1. The pH value of the pulp in this test was 8.2.

(Continued on next page)

(Test No. 2, cont'd) -

Results of Test No. 2;

Product	Weight, per cent	Assays, per cent		Distribution, per cent	
		Cu	S	Cu	S
Concentrate	9.30	21.60	16.18	91.64	93.61
Tailing	91.70	0.18	0.10	8.36	6.39
Feed (cal.)	100.00	1.97	1.43	100.00	100.00

Test No. 3.

Conditions in this test were the same as those in Test No. 2 except that pine oil, 0.043 pound per ton, was used in place of octyl alcohol. The froth looked somewhat cleaner than the froth produced in Test No. 2.

Results of Test No. 3;

Product	Weight, per cent	Assays, per cent		Distribution, per cent	
		Cu	S	Cu	S
Concentrate	7.78	24.14	18.22	90.65	94.47
Tailing	92.22	0.21	0.09	9.35	5.53
Feed (cal.)	100.00	2.07	1.50	100.00	100.00

The results of Tests Nos. 2 and 3 seem to indicate that pine oil will produce a cleaner, higher-grade concentrate than octyl alcohol, with a slightly lower recovery.

Test No. 4.

A sample of siliceous ore with gold-bearing pyrite was ground about 60 per cent through 200 mesh with 1.0 pound soda ash per ton added to the charge. The pulp was conditioned for 5 minutes with 0.10 pound amyl xanthate per ton. A concentrate was then floated with 0.072 pound secondary octyl alcohol per ton. Flotation time was 7 minutes. In Tests Nos. 4, 5 and 6 the pH value of the pulp was in the neighbourhood of 9.6.

(Continued on next page)



(Test No. 4, cont'd) -

Results of Test No. 4;

Product	Weight,		Assays		Distribution,	
	per	cent	Au.	S.	per cent	
	cent	100.	oz./ton	per cent	Au	S
Concentrate	18.67		0.80	18.41	81.08	90.96
Tailing	81.33		0.015	0.42	18.92	9.04
Feed (cal.)	100.00		0.064	3.78	100.00	100.00

Test No. 5.

The conditions were the same in this test as in Test No. 4, except that the quantity of octyl alcohol was reduced to 0.036 pound per ton.

Results of Test No. 5;

Product	Weight,		Assays		Distribution,	
	per	cent	Au.	S.	per cent	
	cent	100.	oz./ton	per cent	Au	S
Concentrate	13.52		0.59	25.75	79.98	87.41
Tailing	86.68		0.015	0.57	20.02	12.59
Feed (cal.)	100.00		0.065	3.92	100.00	100.00

Test No. 6.

In this test again the conditions were the same as in Tests Nos. 4 and 5, except that 0.022 pound pine oil per ton was used as the frother.

Results of Test No. 6;

Product	Weight,		Assays		Distribution,	
	per	cent	Au.	S.	per cent	
	cent	100.	oz./ton	per cent	Au	S
Concentrate	10.17		0.52	32.80	79.69	83.74
Tailing	89.83		0.015	0.71	20.31	16.26
Feed (cal.)	100.00		0.066	3.92	100.00	100.00

By this series of tests it is once more indicated that pine oil will produce a cleaner, higher-grade concentrate than octyl alcohol, with a slightly lower recovery.

In Tests Nos. 5 and 6, one drop of each of the

(Experimental Test Work, -cont'd) -

respective frothers was used, and the figures given in pounds per ton are indicative of their respective weights.

CONCLUSION:

The results of the tests conducted using this reagent show that it has decided frothing properties and could be used as a substitute for pine oil, with certain ores at least. Tests Nos. 1 and 4 indicated that the quantity used should be carefully controlled, or a very dirty, low-grade concentrate will be produced.

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