

No 118 (Portion of)

ORE DRESSING INVESTIGATION 205/44

Mt. Bischoff

Appendix 1.

Test No. 8

Stage ball mill reduction to minus 80 mesh screen size. Classification, tabling to pyritic concentrates. Flotation rejection of sulphides etc., in the table concentrates and concentration of flotation tailings to finished concentrates.

Procedure. The minus 80 mesh ore was classified in a pipe classifier at velocities of 20 and 7 m.m's per second and the products (No. 1 spigot, No. 2 spigot and classifier overflow) were concentrated separately on a No. 13 Wilfley Table to pyritic concentrates. Each concentrate was submitted to rougher and cleaner flotation to remove sulphides with minimum loss of cassiterite and the flotation tailings were vanned to finished concentrates with the exception of the product from No. 1 spigot which was considered a finished concentrate without further treatment.

Flotation Rejection of Sulphides. As shown in previous tests some cassiterite is retained in the sulphide flotation concentrate utilizing copper sulphate and xanthate. Reagents used in this test exclude copper sulphate and substitute sulphuric acid for comparative purposes. During this test work it has been found that pyrrhotite is difficult to effectively float without copper sulphate unless the pulp has a low p.H. value. This value has not been determined and would vary with the nature of the associated gangue minerals and consumption of acid. p.H. values of 4 and lower resulted in excellent flotation conditions.

Flotation Conditions.

Table Concentrate from No. 1. Spigot Rougher & 3 stages of cleaner flotation.

" " " " 2 " " " 2 " " " "

" " " Classifier Overflow " 1 " " " "

REAGENTS. POUNDS PER TON OF ORE/MINUTES.

Table Concentrate From No. 1 Spigot.

	Rougher	Cleaner		
		1st.	2nd.	3rd.
Sulphuric Acid	0.09/25	0.2/5	0.13/5	0.13/5
Ethyl Xanthate	0.07/5	0.14/4	0.04/3	0.04/3
T 43	0.07/4	-	-	-
Pine Oil	0.01	0.01	0.01	0.01
Coal Tar Creosote	0.05	0.05	-	-
Croasylic Acid	-	0.01	-	-
Flotation	/20	/8	/8	/8
p.H. value	6.6	4.0	3.8	3.8

Table Concentrate From No.2 Spiget

	<u>Rougher</u>	<u>Cleaner</u>	
		<u>1st</u>	<u>2nd</u>
Sulphuric Acid	0.07/15	0.07/10	0.07/10
Ethyl Xanthate	0.14/7	-	0.03/4
T 43	-	0.03/4	0.03/4
Pine Oil	0.01	0.01	0.01
Coal Tar Creosote	0.05	0.02	0.03
Flotation	/10	/10	/10
p.H. value	6.6	6.5	6.2

Table Concentrate From Classifier Overflow

	<u>Rougher</u>	<u>Cleaner</u>
	Sulphuric Acid	0.07/15
Ethyl Xanthate	0.03/3	0.03/4
Cresylic Acid	0.02	0.01
Pine Oil	0.01	0.01
Flotation	/4	/3
p.H. Value	6.2	6.0

Total Reagents Used / Pounds Per Ton Of Ore.

Sulphuric Acid	0.67
Ethyl Xanthate	0.52
T 43	0.13
Coal Tar Creosote	0.2
Cresylic Acid	0.04
Pine Oil	0.06

Table Concentration And Flotation

(P.T. in table is an abbreviation for Flotation Tailing)

<u>Product.</u>	<u>Percent</u>		<u>Percent Tin Distribution.</u>
	<u>Weight</u>	<u>Tin</u>	
<u>No. 1 Spiget.</u>			
<u>(Table Concentrate.</u>			
(Flotation Tailing	0.61	55.46	38.78
(Flotation Concentrate	5.93	0.77	5.24
Table Middling	10.27	0.26	3.06
Table Tailing	28.68	0.17	5.61

Table Concentration And Flotation (continued)

(F.T. in table is an abbreviation for Flotation Tailing)

<u>Product</u>	<u>Percent</u>		<u>Percent Tin Distribution</u>
	<u>Weight</u>	<u>Tin</u>	
<u>No. 2. Spigot.</u>			
<u>(Table Concentrate</u>			
(Vanned Concentrate from F.T.	0.13	62.3	10.18
(Vanned Tailing " " "	0.43	0.77	0.38
(Flotation Concentrate	4.32	1.49	7.38
Table Middling	4.98	0.22	1.25
" Tailing	7.35	0.19	1.60
<u>Classifier Overflow.</u>			
<u>(Table Concentrate.</u>			
(Vanned Concentrate from F.T.	0.21	54.7	13.17
( " Tailing " " "	0.42	0.86	0.41
(Flotation Concentrate	0.92	2.40	2.53
Table Middling	0.60	1.07	0.73
" Tailing	35.15	0.24	9.68
Composite	100.00	0.87	100.00
<u>Composite Concentrates.</u>	0.95	57.05	62.13
Ratio of Concentration	105.3		

The three pyritic table concentrates amounted to 12.97 percent by weight with a tin content of 5.25 percent and 78 percent of the total tin. Ratio of concentration 7.7.

Summary.

Tabling to pyritic concentrates, cleaner flotation of sulphides therein and concentration of flotation tailings resulted in a recovery of 62.13 percent of the tin in a concentrate assaying 57.05 percent tin. Ratio of concentration 105.3.

Tabling prior to flotation removes the bulk of the talc and "dolomite" which occasion difficult flotation conditions. ///

The predominant sulphide, pyrrhotite is effectively floated after activation with copper sulphate over a wide range of p.H. values. Promoters such as the xanthates without addition of copper sulphate have been found to be effective with acid pulps only.

The retention of cassiterite in rougher flotation concentrates with either method of flotation is fairly substantial but can be reduced by several stages of cleaner flotation. The tin retained in the three cleaner flotation concentrates amounted to 15.15 percent of the total. Examinations by vanning and concentration on a super-panner show that much of the cassiterite in the flotation concentrates can be concentrated by these methods. Examination of the concentrates obtained from flotation concentrates is being undertaken to investigate possible causes of the flotation of the contained cassiterite.