

MINERAL PROCESSING

AERO® 5100

INCREASE SPHALERITE (ZINC SULFIDE) RECOVERY BY UP TO 6%, USING A COMBINATION OF BUTYL XANTHATE AND AERO® 5100 PROMOTERS

Solvay's AERO® 5100 promoters are powerful collectors for use in the recovery of sphalerite (zinc sulfide), especially when utilized in combination with xanthates. This Technology Note outlines laboratory tests that were conducted using a combination of several types of xanthates and collectors from Solvay's family of AERO® 5100 promoters. It also examines the percentage of zinc that was recovered with various different ratios.

METHODOLOGY

Plant addition rates of xanthate and copper sulfate (CuSO_4) in the zinc rougher/scavenger circuit were measured and the dosages calculated (simulated in laboratory experiments).

Various types of xanthate and/or a collector from the family of AERO® 5100 promoters were added and the pulp conditioned for one minute before collecting a concentrate for three minutes. Second stage additions of xanthates and/or collectors from the family of AERO® 5100 promoters and CuSO_4 were added and again the pulp conditioned for one minute, after which another three-minute concentrate was floated.

Finally, a xanthate and/or collector from the family of AERO® 5100 promoters was administered into the cell and allowed to condition for a minute before a third concentrate was removed from the cell for three minutes.

The concentrate and tailing samples were dewatered and analyzed for their zinc content – the data from these analyses is reflected in the tables on the following page. For accuracy, the trials were repeated and the calculation of average zinc recovery was also repeated.

RESULTS

Table 1

EXAMPLES	% COLLECTOR FROM FAMILY OF AERO® 5100 PROMOTERS	% BUTYL XANTHATE	% ZINC RECOVERED	AVERAGE ZINC RECOVERED
1A	0	100	93.9	
1B	0	100	95.9	94.9
2A	10	90	98.2	
2B	10	90	98.2	98.2
3A	20	80	99.8	
3B	20	80	99.9	99.9
4A	30	70	96.5	
4B	30	70	96.5	96.5
5A	40	60	99	
5B	40	60	99.2	99.1

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6A	50	50	95	
6B	50	50	95	95
7A	100	0	86.5	
7B	100	0	86.3	86.4

Table 2

EXAMPLES	% COLLECTOR FROM FAMILY OF AERO® 5100 PROMOTERS	% ISOPROPYL XANTHATE	% ZINC RECOVERED
8	1	99	93.8
9	10	90	97.9
10	20	80	99.4
11	30	70	98.2
12	40	60	98.8
13	50	50	94.6
14	100	0	84.2

Table 3

EXAMPLES	% COLLECTOR FROM FAMILY OF AERO® 5100 PROMOTERS	% ETHYL XANTHATE	% ZINC RECOVERED
15	1	99	92.8
16	10	90	96.4
17	20	80	98.1
18	30	70	94.2
19	40	60	97.3
20	50	50	92.9
21	100	0	84.7

These results indicate that for the recovery of sphalerite, the optimum concentration of AERO® 5100 promoters to xanthates is about 20:80.

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