

019796

SUPPLEMENTARY TEST

OF

GRUM ORE

by Dowa Mining Co., Ltd.

May 1977

We, investigators, had been discontented with the previous test results, especially for zinc-pyrite separation. We considered that the difficulties of zinc-pyrite separation are due to the mineral complexity feature of the Grum ores. They are solely due to hi-pyritic ore disseminated finely, as mentioned previously.

These supplementary tests were intended for the recovery and the purification of the zinc concentrate in particular. After recovering lead through the conventional flotation method using sodium cyanide, the rougher zinc concentrate was floated by using copper sulfate. The rougher zinc concentrate, which highly contained iron sulfide minerals was filtered and stocked two or three days for heaping to get high zinc recovery. Through the heaping, the surface of the iron sulfides were tarnished and converted to iron oxides. The heaped rougher zinc concentrate was repulped by hot water and floated. This heaping process can be replaced by the continual treatment with the low pressure autoclaving, while the retention time of the pulp would be thirty minutes. If you request, we will introduce the process specification.

#### A. TEST RESULT

The results and the flowsheets of the supplementary tests are described as follows:

The tests consist of biotite flotation, lead flotation and zinc flotation using the heaping process. The results and the flowsheets, including the conditionings, were summed up in the cycle tests, as mentioned in the previous report.

##### a. Biotite Flotation

According to the preliminary tests, the flotation behavior of Grum's biotite was cleared. A part of Grum's biotite is easy floatable and not depressed

during the sulfide mineral flotation by usual depressant, for instance sodium silicate, quebracho, etc. Therefore, the floatable biotite was rejected by using only froth prior to the lead flotation in this supplementary test. The remaining biotite, which was not rejected, did not disturb the sulfide flotation.

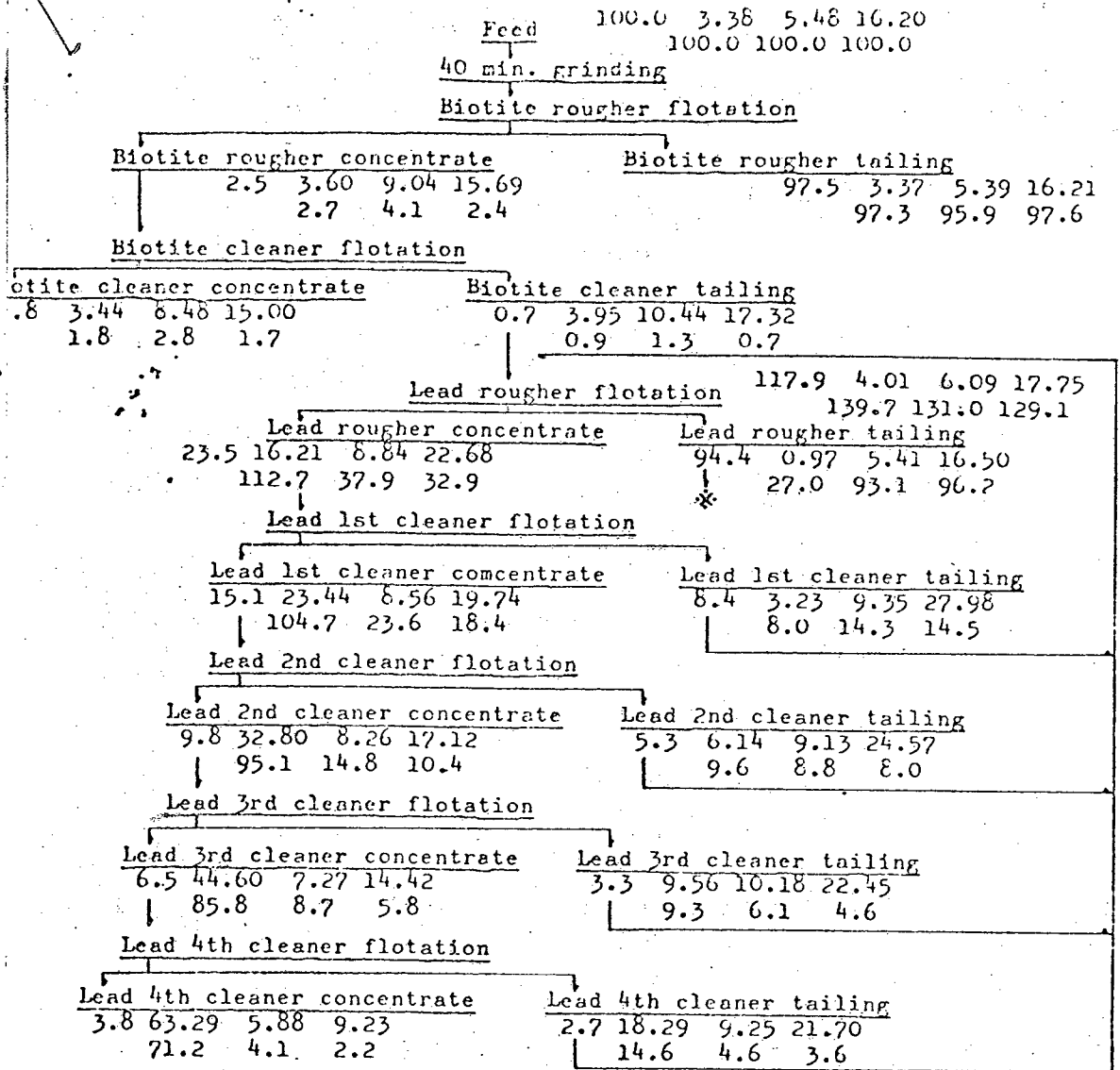
b. Lead Flotation

The lead concentrate was gained through four stage cleaning circuits, by using sodium cyanide as depressant and sodium amylxanthate as collector. Average sodium cyanide consumption was 500 g/feed ton. The lead concentrate assaying 63.29% Pb was produced with a lead recovery of 71.2% leaving the tailing as zinc flotation feed that assays 0.97% Pb, 5.41% Zn and 16.50% Fe.

c. Zinc Flotation

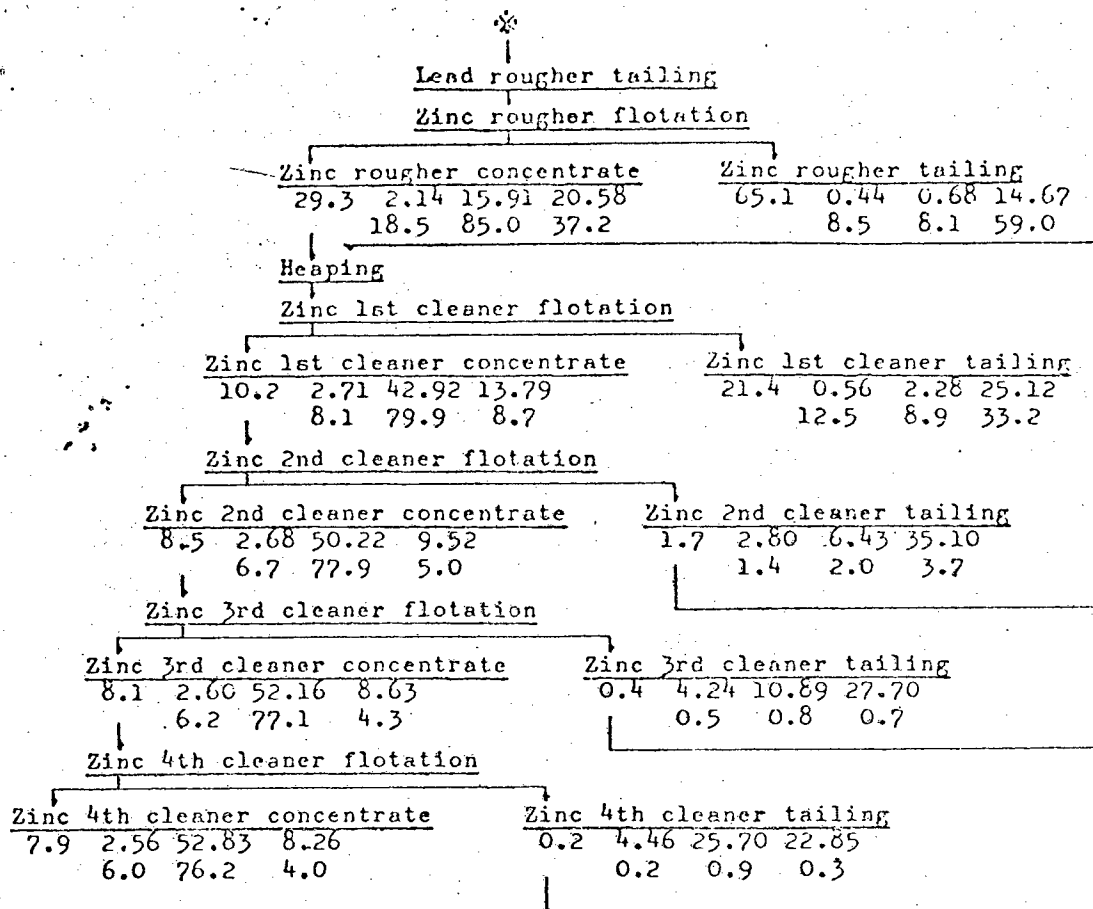
As above mentioned, the rougher zinc concentrate was refloated after conditioning by the heaping process for the purpose of high recovery of zinc, while the pulp temperature is controlled at 50°C. The zinc concentrate assays 52.83% Zn and Zinc recovery is 76.2%, but carried Pb assaying 2.56%.

Flowsheet and result of the cyclotest



Conditioning & flotation	Reagent consumption (gram/ton)
Biotite rougher flotation	Natural pH 7.6, Dow#250 20. 8 min.-flotation time.
Biotite cleaner flotation	5 min. flotation time.
Lead rougher conditioning & flotation	Line 1000, pH 10.5, Amyl xanthate 80, Dow#250 10, 15 min. flotation time.
Lead 1st cleaner conditioning & flotation	10 min. regrinding, Sodium cyanide 300, Amyl xanthate 15, 10 min. flotation time.
Lead 2nd cleaner conditioning & flotation	Sodium cyanide 100, 7 min. flotation time.
Lead 3rd cleaner conditioning & flotation	Sodium cyanide 50, 7 min. flotation time.
Lead 4th cleaner conditioning & flotation	Sodium cyanide 50, 7 min. flotation time.

Legend	Weight %			Assay %		
	Lead	Zinc	Iron	Lead	Zinc	Iron
				Distribution %		
	Lead	Zinc	Iron			



Conditioning & flotation	Reagent consumption (gram/ton)
Zinc rougher conditioning & flotation	30 min. regrinding Copper sulphate 2000, Lime 3000, pH 12, Amyl xanthate 150, Dow#250 25, 10 min.- flotation time, after pH 11.
Heaping	Zinc rougher concentrate was filtrated and had been heaped for 4 days.
Zinc 1st cleaner conditioning & flotation	Zinc rougher concentrate was repulped by hot water. Copper sulphate 500, Lime 200, Amyl xanthate 20, Dow#250 10, The pulp- temperature was kept at 50°c. 10 min. flotation time, after pH 10.5.
Zinc 2nd cleaner conditioning & flotation	Lime 100, Amyl xanthate 8, The pulp- temperature was 50°c, 8 min. flotation- time, after pH 10.5.
Zinc 3rd cleaner conditioning & flotation	Lime 80, Amyl xanthate 6, The pulp- temperature was 50°c, 8min. flotation- time, after pH 10.5.
Zinc 4th cleaner conditioning & flotation	Lime 80, Amyl xanthate 6, The pulp- temperature was 50°c, 8 min. flotation- time, after pH 10.5.