ABSTRAK

Pada penelitian ini menggunakan dua macam sampel yaitu *fresh ore* dan *stockpile ore* yang berasal dari salah satu tambang tembaga di Nusa Tenggara Barat. Hasil uji kadar menggunakan AAS menunjukkan pada *fresh ore* mengandung kadar Cu sebesar 0.47 % dan kadar ASCu (*Acid Soluble Copper*) sebesar 0.05 %, sedangkan *stockpile ore* mengandung kadar Cu sebesar 0.30 % dan kadar ASCu (*Acid Soluble Copper*) sebesar 0.06 %. Penelitian ini dilakukan untuk menganalisis pengaruh dari variasi rasio *blending ore*, *process water*, dan skema optimal terhadap *recovery*, kadar konsentrat, dan *mass pull* menggunakan metode flotasi. Adanya kandungan ASCu pada bijih memerlukan proses sulfidasi pada proses flotasi untuk mengubah sifat permukaan mineral yang hidrofilik menjadi hidrofobik sehingga Cu yang teroksidasi bisa mengapung. Manfaat penelitian ini berupa rekomendasi pemilihan skema flotasi pada variasi *blending ore* dan variasi *process water* dalam operasi pengolahan bijih tembaga di perusahaan X.

Pada penelitian ini dilakukan *blending* antara *fresh ore* dan *stockpile ore* dengan rasio 70 % FO + 30 % SO, 50 % FO + 50 % SO, 30 % FO + 70 % SO, dan variasi *process water* 100 % *sea water*¸ 100 % *mine water*, 50 % SW + 50 % MW, dan 70 % SW + 30 % MW. Penelitian ini dimulai dengan melakukan homogenisasi sampel menggunakan *cone and quartering* dan *rotary sampler* agar kadar tembaga pada sampel menjadi homogen. Hasil dari *rotary sampler* dikemas perbagian dengan plastik. Setelah proses homogenisasi, masing – masing sampel diambil satu plastik secara acak untuk dilakukan analisis AAS untuk mengetahui *head grade*. Lalu dilakukan *grinding establishment* pada masing – masing rasio *blending ore* untuk mengetahui *grinding time* pada ukuran p80 220 µm. Kemudian dilakukan proses flotasi yang terbagi menjadi dua skema dengan perbedaan reagen, pada skema A menggunakan reagen milik perusahaan X dan skema B menggunakan reagen PT Florrea Solution Indonesia. Kedua skema flotasi dilakukan pada parameter ukuran butir sebesar 220 µm, berat umpan 1350 gram, % solid 35 %, *adjustment* pH 9, *air injection* 5 L/min, *impeller speed* 1500 rpm, *scrapper frequency* 15 rpm (*stage* 1-2) – 9 (*stage* 3-4) rpm, *scrapping time* 5 min, *cell volume* 3 L.

Hasil penelitian menunjukkan pada flotasi skema A rata – rata *recovery* Cu sebesar 75.4 %, rata – rata kadar konsentrat sebesar 9.90 % dan rata – rata *mass pull* sebesar 2.98 %. Sedangkan pada flotasi skema B rata – rata *recovery* Cu sebesar 79.0 %, rata – rata kadar konsentrat sebesar 9.81 % dan rata – rata *mass pull* sebesar 3.28 %. Dari hasil penelitian tersebut dapat disimpulkan bahwa proses flotasi skema B lebih berhasil ditinjau dari nilai *recovery* dan *mass pull*, walaupun kadar konsentrat lebih rendah tetapi hal ini tidak menjadi masalah karena *deviation* tergolong kecil yaitu sebesar 0.09 %.

Kata Kunci: *Fresh Ore, Stockpile Ore, Process Water,* Tembaga, Sulfidasi, Flotasi

ABSTRACT

This study uses two kinds of samples, fresh ore and stockpile ore from one of the copper mines in West Nusa Tenggara. The results of the content test using AAS show that fresh ore contains Cu content of 0.47% and ASCu (Acid Soluble Copper) content of 0.05%, while stockpile ore contains Cu content of 0.30% and ASCu (Acid Soluble Copper) content of 0.06%. This study was conducted to analyse the effect of variations in ore blending ratio, process water, and optimal scheme on recovery, concentrate content, and mass pull using the flotation method. The presence of ASCu content in the ore requires a sulfidation process in the flotation process to change the surface properties of hydrophilic minerals to hydrophobic so that oxidized Cu can float. The benefits of this research are in the form of recommendations for the selection of flotation schemes for ore blending variations and process water variations in copper ore processing operations at X Company.

In this study, blending between fresh ore and stockpile ore was carried out with a ratio of 70% FO + 30% SO, 50% FO + 50% SO, 30% FO + 70% SO, and process water variations of 100% sea water¸ 100% mine water, 50% SW + 50% MW, and 70% SW + 30% MW. This research begins with homogenizing the sample using cone and quartering and rotary sampler so that the copper content in the sample becomes homogeneous. The results of the rotary sampler were packed per section with plastic. After the homogenization process, each sample was taken one plastic randomly for AAS analysis to determine the head grade. Then grinding establishment is carried out at each ore blending ratio to determine the grinding time at a size of p80 220 µm. Then the flotation process was divided into two schemes with different reagents, in scheme A using company X's reagents and scheme B using PT Florrea Solution Indonesia's reagents. Both flotation schemes were carried out at grain size parameters of 220 µm, feed weight 1350 grams, solid % 35%, pH adjustment 9, air injection 5 L/min, impeller speed 1500 rpm, scrapper frequency 15 rpm (stage 1-2) - 9 (stage 3-4) rpm, scrapping time 5 min, cell volume 3 L.

The results showed that in flotation scheme A the average Cu recovery was 75.4%, the average concentrate content was 9.90% and the average mass pull was 2.98%. While in flotation scheme B the average Cu recovery was 79.0%, the average concentrate content was 9.81% and the average mass pull was 3.28%. From the results of this study, it can be concluded that the scheme B flotation process is more successful in terms of recovery and mass pull values, although the concentrate content is lower, but this is not a problem because the deviation is relatively small at 0.09%.

Keywords: *Fresh Ore, Stockpile Ore, Process Water, Copper, Sulfidation, Flotation*