

ABSTRAK

Pada penelitian ini dilakukan pengolahan kembali *middling* dari proses pengolahan mineral yang dilakukan di PT. Timah Tbk yang masih mengandung mineral *cassiterite* menggunakan alat *three disc magnetic separator* dengan variasi kuat arus listrik dan jarak ketinggian magnet dengan *belt*. Produk yang dihasilkan diuji menggunakan XRF (*X-Ray Fluorescence*) untuk mengetahui nilai kadar Sn dan mencari nilai *recovery* Sn. Variasi kuat arus listrik yang digunakan yaitu mulai dari 0.3 A hingga 1.3 A yang nantinya akan dibagi menjadi 3 variasi serta variasi jarak ketinggian magnet dengan *belt* yang digunakan yaitu 0.7, 1 dan 1.3 cm. Penelitian ini dilakukan 9 kali pengujian yang nantinya akan dicari kadar dan *recovery* optimum yang dihasilkan. Hasil penelitian menunjukkan distribusi persebaran timah pada setiap fraksi ukuran. Selain itu kadar Sn dan *recovery* Sn yang dihasilkan juga bervariasi untuk setiap variasi pengujian. Kadar Sn (%) tertinggi, sebesar 27.1%, diperoleh pada pengujian dengan variasi kuat arus listrik tertinggi dan jarak ketinggian magnet paling kecil. Sementara itu, *recovery* tertinggi sebesar 85.12% diperoleh pada pengujian dengan kuat arus listrik terkecil dan jarak ketinggian magnet paling besar. Berdasarkan hasil penelitian, semakin tinggi kuat arus listrik yang digunakan maka kadar Sn yang diperoleh juga akan semakin tinggi namun untuk *recovery* Sn yang didapatkan akan semakin rendah, hal tersebut karena penggunaan kuat arus listrik yang tinggi akan menyebabkan mineral *magnetic* lebih banyak tertarik oleh magnet sehingga kadar yang dihasilkan akan meningkat. Sedangkan semakin tinggi jarak ketinggian magnet dengan *belt* yang digunakan maka kadar Sn yang diperoleh akan semakin rendah namun untuk *recovery* Sn yang didapatkan akan semakin tinggi, hal tersebut karena apabila jarak magnet dengan *belt* tinggi maka kekuatan magnet yang dihasilkan akan melemah sehingga mineral *magnetic* yang tertarik oleh magnet akan semakin sedikit. Serta untuk kadar dan *recovery* optimum dilihat dari kadar Sn pada produk *magnetic* dan *non-magnetic* serta dilihat dari nilai *recovery* didapatkan pada penelitian menggunakan kuat arus listrik dan jarak ketinggian magnet dengan *belt* menengah dengan kadar Sn sebesar 12.2% dan *recovery* Sn sebesar 54.67%.

Kata Kunci: *Three Disc Magnetic Separator, Middling, Cassiterite*

ABSTRACT

In this research, middlings were reprocessed from the mineral processing process carried out at PT. Timah Tbk, which still contains the mineral cassiterite, uses a three disc magnetic separator with variations in the strength of the electric current and the distance between the height of the magnet and the belt. The resulting product was tested using XRF (X-Ray Fluorescence) to determine the Sn content value and find the Sn recovery value. Variations in the strength of the electric current used are from 0.3 A to 1.3 A which will later be divided into 3 variations as well as variations in the distance between the height of the magnet and the belt used, namely 0.7, 1 and 1.3 cm. This research was carried out 9 times and then the optimum levels and recoveries produced were determined. The research results show the distribution of tin in each size fraction. Apart from that, the Sn content and Sn recovery produced also varies for each test variation. The highest Sn content (%), amounting to 27.1%, was obtained in the test with the highest variation in electric current strength and the smallest magnetic height distance. Meanwhile, the highest recovery of 85.12% was obtained in the test with the smallest electric current strength and the largest magnetic height distance. Based on the research results, the higher the electric current used, the higher the Sn content obtained will be, but the Sn recovery obtained will be lower, this is because the use of high electric current strength will cause magnetic minerals to be attracted more by the magnet so that the levels output will increase. Meanwhile, the higher the distance between the magnet and the belt used, the lower the Sn content obtained will be, but the Sn recovery obtained will be higher, this is because if the distance between the magnet and the belt is high, the resulting magnetic strength will weaken so that magnetic minerals are attracted by it. there will be fewer magnets. As well as the optimum content and recovery seen from the Sn content in magnetic and non-magnetic products and seen from the recovery value obtained in research using electric current strength and the distance between the height of the magnet and the middle belt with a Sn content of 12.2% and Sn recovery of 54.67%..

Keywords: *Three Disc Magnetic Separator, Middling, Cassiterite*