COAL SIZE OPTIMIZATION IN EXTRACTION PROCESS OF MALACHITE USING MINI BLAST FURNACE

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Abstract

Pyrometallurgy is a extraction process of metals using thermal treatment. Temperatures up to 2000 °C can be achieved. To run this process using the Mini Blast Furnace.

In this research observed effect the coal size thereby optimizing copper ore refining process using a mini blast furnace. Testing bomb calorimeter and proximate analysis to determine calorific value and fixed carbon in the coal. XRF testing is used to determine percentage of Cu content before and after the extraction process. XRF testing is also used for to determine percentage of CaO content.

Coal is prepared by crushing for reducing the size 3x3 cm$^2$, 6x6 cm$^2$, and 9x9 cm$^2$ for variation. First, entered coal by size 3x3 cm$^2$ entered to furnace, then copper ore and limestone as flux in the furnace. Hot air entering from tuyer. The same of step used for 6x6 cm$^2$ and 9x9 cm$^2$ coal size. Molten metals taken through the tapping point for 1 minute from each melting process to observe the product flow rate.

From this research, it appears that the coal size affects the smelting process. Increasingly higher coal size, the product flow rate is also increased. However, the highest Cu content occurs when the coal size 6x6 cm$^2$.

Keywords: extraction, copper, coal size, mini blast furnace.
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