

Pengaruh waktu dan kecepatan agitasi pelindian atmosferik terhadap perolehan nikel dari bijih saprolit = The effect of duration and agitation speed of atmospheric leaching on the recovery percentage of nickel from saprolite ores

Sihotang, Juan Carlos, author

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Abstrak

Nikel merupakan logam penting yang banyak digunakan dalam paduan, misalnya baja tahan karat, paduan ruang angkasa, dan paduan khusus. Nikel ditambang dari dua jenis bijih: laterit dan sulfida. Laterit banyak ditemukan di daerah tropis seperti di Indonesia dan ditambang untuk memperoleh nikel dan kobalt. Pelindian bijih nikel laterit pada tekanan atmosfer saat ini banyak menarik perhatian karena biaya yang lebih rendah dibanding proses lainnya. Tujuan penelitian ini adalah untuk menentukan pengaruh waktu dan kecepatan agitasi pelindian atmosferik terhadap persentase perolehan nikel dari bijih laterit jenis saprolit. Bijih nikel saprolit dari Halmahera Timur digunakan dalam penelitian. Untuk mengetahui nilai perolehan nikel pada waktu dan kecepatan agitasi yang berbeda, pelindian teragitasi dilakukan selama 1, 3, dan 5 jam dengan kecepatan agitasi masing-masing 250 rpm, 500 rpm, dan 750 rpm. Selama penelitian, berat sampel yang telah dihaluskan (15 g), konsentrasi asam sulfat (5N (240.1 g/L)), volume asam sulfat (75 ml), dan suhu (100°C) dijaga konstan. Dapat dilihat bahwa dalam pelindian teragitasi, peningkatan waktu pelindian dari 1 jam hingga 5 hour memiliki pengaruh positif terhadap perolehan nikel. Peningkatan kecepatan agitasi dari 250 rpm hingga ke 750 rpm juga meningkatkan nilai perolehan nikel.

.....Nickel is important metal that is mostly used in alloys, for example, in stainless steels, aerospace alloys and specialty steels. Nickel is mined from two types of ores: laterites and sulfides. Laterites are found mostly in tropical regions and are mined for their nickel and cobalt in countries like Indonesia. Leaching lateritic nickel ores with sulphuric acid at atmospheric pressure (AL) has been recently receiving more attention due to lower cost compared to other processes. The purpose of this study is to determine the effect of duration and agitation speed of atmospheric leaching to the recovery percentage of nickel from saprolitic type laterit ore. Saprolitic nickel ores from Eastern Halmahera were used during experiments. In order to study the recovery values at different time periods and different agitation speeds, agitative leaching experiments were carried out for 1, 3, and 5 hours with agitation speed 250 rpm, 500 rpm, and 750 rpm, respectively. During the experiments, weight of ground ore sample (15 g), concentrations of sulfuric acid (5N (240.1 g/L)), volume of sulfuric acid (75 ml), and temperature (100°C) were kept constant. It was shown that in agitative leaching, increasing leaching time from 1 hour to 5 hour had a positive effect on metal extractions. Increasing agitation speed from 250 rpm to 750 rpm also increased the recovery values of nickel.