Pengaruh konsentrasi, temperatur, dan waktu pada hasil pelindian H2SO4 terhadap peningkatan kadar besi dan magnesium dari terak feronikel = The effect of concentration, temperature, and leaching time of sulfuric acid (H2SO4) on increasing iron and magnesium content from ferronickel slag

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Abstrak

Indonesia merupakan salah satu negara yang memiliki deposit bijih nikel laterit terbesar di dunia. Maka dari itu tuntutan produksi nikel di Indonesia sangat tinggi. Hal itu menyebabkan jumlah smelter pengolahan feronikel semakin meningkat. Setiap satu ton feronikel hasil peleburan menghasilkan delapan ton terak feronikel. Hingga saat ini pemanfaatan terak feronikel di Indonesia masih sangat minim. Penelitian ini menjelaskan tentang peningkatan kadar besi dan magnesium dari terak feronikel dengan metode hidrometalurgi menggunakan pelindian asam sulfat (H2SO4) dengan variasi konsentrasi 0,5, 1,0, 1,5, 2,0, dan 2,5 M, variasi temperatur 32, 50, dan 90°C, serta variasi waktu 10, 20, 30, 60, dan 90 menit untuk mendapatkan kondisi paling efisien. Setelah dilakukan pelindian dilanjutkan ke proses karakterisasi ICP-OES, XRD, dan XRF. Dari karakterisasi didapatkan hasil ekstraksi Fe dan Mg terbesar yaitu 99,12% dan 99,08% pada variabel konsentrasi 2,5 M, temperatur 90°C, dan waktu 90 menit.
.....Indonesia has one of the world’s largest laterite nickel ore deposits. Therefore, the demand for nickel production in Indonesia is very high. This causes the number of ferronickel processing smelters to increase. Every ton of ferronickel smelter produces eight tons of ferronickel slag. Until now, the utilization of ferronickel slag in Indonesia is still very limited. This study aimed to extract iron (Fe) and magnesium (Mg) concentration from ferronickel slag by hydrometallurgical method using sulfuric acid (H2SO4) leaching with various concentrations of 0.5, 1.0, 1.5, 2.0, and 2.5 M, temperature variations 32, 50, and 90°C, as well as time variations of 10, 20, 30, 60, and 90 minutes to get the most efficient conditions. Several characterizations including ICP-OES, XRD, and XRF were carried out in order to elucidate as well as calculate percentage of the extracted Fe and Mg. The optimum conditions for extraction of both Fe and Mg were at 90°C for 90 minutes under 2,5 M H2SO4 with the highest extraction of Fe and Mg were 99,12% and 99,08%, respectively.