Pengaruh Penambahan 20%w/w Magnesia (MgO) terhadap Presipitasi Nikel dan Kobalt Pada Produk Nikel Laterit Hasil Pelindian Atmosferik dengan Tiga Tahap Iron Removal untuk Produksi Mixed Hyroxide Precipitate (MHP) = Effect of 20%w/w Magnesia (MgO) Addition on Nickel and Cobalt Precipitation in Atmospheric Leaching Nickel Laterite Products with Three Stages of Iron Removal for Mixed Hydroxide Precipitate (MHP) Production

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Abstrak

Penelitian ini menggunakan sampel bijih nikel laterit yang telah dilindi dengan metode pelindian atmosferik di lab Badan Pengkajian dan Penerapan Teknologi (BPPT). Penelitian ini berfokus untuk mengendapkan pengotor pada PLS, terutama pengotor besi, yang bertujuan untuk menghasilkan mixed hydroxide precipitate pada produk akhirnya. Untuk mengendapkan pengotor tersebut, dilakukan proses yang disebut iron removal sebanyak tiga tahap, yaitu dengan secara berurutan dilakukan titrasi reagen kalsium karbonat (CaCO3) dengan kandungan 25%w/w, 15%w/w, dan 12,5%w/w kedalam PLS hingga mencapai pH 2, 3, dan 3,5. Selanjutnya sampel tersebut dipanaskan dengan temperatur 90oC selama 2, 1,5, dan 1 jam. Pada penelitian diakhiri dengan proses titrasi MHP dengan dilakukan titrasi reagen magnesia (MgO) dengan kandungan 20%w/w kedalam PLS hingga mencapai pH 7. Selanjutnya sampel tersebut dipanaskan dengan temperatur 50oC selama 0,5 jam. Secara keseluruhan hasil penelitian, ditemukan bahwa proses iron removal sebanyak 3 tahap mampu mengurangi kadar pengotor, terutama besi, secara signifikan. Kadar besi mampu berkurang dengan %recovery total mencapai 7,46%. Berbeda dengan kadar nikel dan kobalt yang banyak terbuang pada proses iron removal dengan %recovery nikel sebesar 66,63% dan kobalt sebesar 12,51%. Pada hasil proses titrasi MHP menunjukkan hasil yang belum optimal, hal tersebut diindikasikan oleh kadar nikel dan kobal yang tidak bertambah secara signifikan dan kadar pengotor yang masih ada pada MHP. Kadar nikel pada endapan hanya sebesar 19,3%.

.....This research used samples of lateritic nickel ore that had been leached using the atmospheric leaching method at Badan Pengkajian dan Penerapan Teknologi (BPPT) lab. This research focuses on precipitating impurities in PLS, especially iron impurities, which aims to produce mixed hydroxide precipitate in the final product. To precipitate these impurities, a process called iron removal was carried out in three stages, iron removal is carried out in series by titrating calcium carbonate reagent (CaCO3) with a content of 25%w/w, 15%w/w, and 12,5%w/w into PLS until it reaches a pH of 2, 3, and 3,5. Furthermore, the sample was heated to a temperature of 90oC for 2, 1,5, and 1 hours. The research ended with the MHP titration process by titrating magnesia reagent (MgO) with a content of 20% w/w into PLS until it reached pH 7. Then the sample was heated to a temperature of 50oC for 0,5 hour. Overall, the results of the study found that the 3-stage iron removal process was able to significantly reduce the levels of impurities, especially iron. Iron content can be reduced with total % recovery reaching 7,46%. In contrast to the nickel and cobalt content, which was mostly precipitate in the iron removal process, with % nickel recovery of 66.63% and cobalt of 12,51%. The results of the MHP titration process showed results that were not optimal, this was indicated by the levels of nickel and cobalt which did not increase significantly and the levels of impurities that were still

present in the MHP. The nickel content in the precipitate is only 19,3%.