

Pelindihan Nikel, Kobalt, dan Besi Secara Selektif dari Bijih Nikel Lateritik Dengan Menggunakan Asam Organik = Selective Leaching of Nickel, Cobalt, and Iron from Laterite Ores Using Organic Acids

Adisa Umari Yoniton, author

Deskripsi Lengkap: <https://lib.ui.ac.id/detail?id=20499603&lokasi=lokal>

Abstrak

Peran dan perilaku asam organik pada pelindihan bijih nikel lateritik diamati dalam eksperimen berikut sebagai alternatif dari proses pelindihan asam anorganik, HPAL (High-Pressure Acid Leaching). Eksperimen dilakukan dengan menggunakan dua tahapan (sequensial), yaitu pelindihan elemen besi menggunakan asam oksalat ($C_2H_2O_4$) dan diikuti dengan pelindihan nikel dan kobalt menggunakan asam sitrat ($C_6H_8O_7$). Secara spesifik, efek dari beragamnya suhu pelindihan, konsentrasi asam organik, dan waktu pelindihan telah diamati. Dengan ini, memperoleh konklusi bahwa suhu dan waktu sangat mempengaruhi proses pelindihan. Meningkatkan suhu pelindihan hingga 90 oC dapat menghilangkan 49% besi dan hanya memulihkan 3% nikel dan 8% kobalt. Hasil eksperimen juga membuktikan bahwa semakin lama waktu pelindihan, maka pemulihan nikel dan kobalt semakin tinggi dan selektif. Sementara itu, pada konsentrasi asam organik yang tinggi, pemulihan nikel dan kobalt tidak terlalu efektif. Data eksperimen dianalisa menggunakan XRF/XRD dan ICP-OES.

<hr>

The role and behaviour of organic acids in the leaching of nickel laterite ore were investigated in the following experiments as an alternative to the leaching process of inorganic acids, HPAL (High-Pressure Acid Leaching). Experiments were carried out using two steps (sequential); firstly, leaching of iron using oxalic acid ($C_2H_2O_4$) and followed by leaching of nickel and cobalt using citric acid ($C_6H_8O_7$). Specifically, the leaching parameters such as temperature, organic acid concentration, and leaching time were observed. The experiment concluded that temperature and time have greatly impact on the leach process. Increasing the leaching temperature to 90 oC with 1 M of oxalic acid concentration can remove 49% of iron with only 3% nickel and 8% cobalt were recovered. The experimental results also prove that longer leaching time resulted in higher and more selective nickel and cobalt recovery. Meanwhile, at a high concentration of citric acid, the recovery of the nickel and cobalt were not very effective. Experimental data were analysed using XRF / XRD and ICP-OES. <i>