

ABSTRAK

PENGARUH VARIASI TEMPERATUR, WAKTU TAHAN DAN KONSENTRASI REDUKTOR TERHADAP PRODUK REDUKSI KARBOTERMIK BIJIH NIKEL KADAR RENDAH DENGAN REDUKTOR ANTRASIT DAN BAHAN ADITIF MAGNESIUM SULFAT

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Telah dilakukan penelitian reduksi selektif bijih nikel laterit dengan variasi temperatur sebesar 950°C, 1050°C dan 1150°C, waktu tahan 60, 90 dan 120 menit dan konsentrasi reduktor batubara antrasit 5, 10 dan 15% wt. terhadap produk reduksi nikel laterit menggunakan bahan aditif magnesium sulfat 10% dan dilanjutkan dengan proses separasi magnetik. Karakterisasi *X-ray Diffraction* (XRD) menunjukkan fasa yang dominan adalah *Magnesioferrite* (Fe_2MgO_4), *Magnetite* (Fe_3O_4), *Fayalite* (Fe_2SiO_4), *Iron Nickel* (FeNi), *Iron Sulfide* (FeS) dan *Wuestite* (FeO). Karakterisasi *X-ray Fluorescence* (XRF) menunjukkan bahwa kadar nikel optimum didapatkan pada temperatur reduksi 1150°C selama 90 menit dengan penambahan reduktor 5% diperoleh nilai 2,086% dan *recovery* 80,68%. Karakterisasi *Scanning Electron Microscope* (SEM) yang dilengkapi *Energy Dispersive X-ray Spectroscopy* (EDS) menunjukkan bahwa ukuran butir terbesar adalah 10,31 μm .

Kata kunci: nikel laterit, batubara antrasit, magnesium sulfat, reduksi selektif, separasi magnetik.

ABSTRACT

EFFECT OF TEMPERATURE VARIATION, TIME AND TOTAL REDUCING HOLD ON KARBOTERMIK SELECTIVE REDUCTION OF NICKEL ORE WITH LOW LEVELS OF MAGNESIUM SULFATE ADDITIVE AND REDUCING ANTHRACITE

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Has conducted research laterite selective reduction of nickel ore with variations temperature of 950°C, 1050°C and 1150°C, The holding time 60, 90 and 120 minutes and the concentration of anthracite coal reductant 5, 10 and 15% wt. to the reduction of laterite nickel product using magnesium sulfate additive is 10% and continued with the process of magnetic separation, Characterization X-ray Diffraction (XRD) showed that the dominant phase is Magnesioferrite (Fe_2MgO_4), Magnetite (Fe_3O_4), Fayalite (Fe_2SiO_4), Iron Nickel (FeNi), Iron Sulfide (FeS) and Wuestite (FeO). Karakterisasi X-ray Fluorescence (XRF) showed that the optimum nickel grade obtained at temperatures of 1150°C reduction for 90 minutes with the addition of 5% reductant obtained recovery value of 2,086% and 80.68%. Characterization Scanning Electron Microscope (SEM) equipped with Energy Dispersive X-ray Spectroscopy (EDS) showed that the largest grain size is 10,31 μm .

Keywords: nickel laterite, anthracite coal, magnesium sulfate, selective reduction, magnetic separation.