

ABSTRAK

PENGARUH JENIS REDUKTAN PADA PROSES REDUKSI SELEKTIF BIJIH NIKEL LATERIT

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Indonesia merupakan penghasil nikel terbesar ke lima di dunia. Terdapat 2 jenis bijih nikel yang banyak digunakan sebagai bahan baku pembuatan logam nikel yaitu bijih jenis sulfida dan laterit. Pada penelitian ini, percobaan untuk meningkatkan kadar nikel dalam bijih nikel laterit telah dilakukan dengan cara membuat pelet dari campuran bijih nikel laterit jenis limonit, reduktan jenis fosil dan reduktan jenis biomassa, serta aditif Na_2SO_4 , dilanjutkan dengan reduksi sampel dengan pemanggangan dalam *muffle furnace* pada temperatur 1150 °C dan waktu pemanggangan selama 1 jam. Hasil reduksi kemudian digiling menggunakan *shaker mill* untuk selanjutnya dicampur dengan air dan dipisahkan dengan alat pemisah magnet untuk memisahkan konsentrat dan *tailing*. Karakterisasi seperti XRF, XRD, dan FE-SEM digunakan untuk memastikan kandungan nikel dan besi, perubahan fasa, dan struktur mikro feronikel. Hasil optimal pada penambahan reduktan jenis fosil diperoleh pada penambahan batu bara-0,71 S dengan kadar nikel sebesar 6,14% dengan *recovery* nikel sebesar 89,94%. Sedangkan hasil optimal pada penambahan reduktan jenis biomassa diperoleh pada penambahan arang cangkang sawit dengan kadar nikel sebesar 4,70% dengan *recovery* nikel sebesar 43,89%.

Kata Kunci: Nikel laterit, limonit, reduktan jenis fosil, reduktan jenis biomassa

ABSTRACT

THE EFFECT OF REDUCTANT TYPE ON THE SELECTIVE REDUCTION PROCESS OF LATERITE NICKEL ORE

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Indonesia is the fifth largest nickel producer in the world. There are 2 types of nickel ore which are widely used as raw materials for making nickel metal, there are sulfide and laterite ores. In this research, an experiment to increase the nickel grades in the laterite nickel ore was carried out by making pellets from a mixture of limonitic type of laterite nickel ore, fossil type reductants and biomass type reductants, as well as Na_2SO_4 additive, followed by reducing the sample by roasting in a muffle furnace at 1150°C temperature and one-hour roasting time. The reduced ore from reduction process was grounded in shaker mill, then mixed with water and passed to magnetic separator to separate concentrate and tailing. Techniques such as XRF, XRD, and SEM-EDS are employed to ascertain the content of nickel and iron, phase changes, and the microstructure of the ferronickel. Optimal results for the addition of fossil type reductants were obtained from the addition of coal-0.71 S with a nickel grade of 6.14% and nickel recovery of 89.94%. Meanwhile, optimal results from the addition of biomass type reductants were obtained from the addition of palm shell charcoal with a nickel grade of 4.70% and nickel recovery of 43.89%.

Keywords: *Laterite nickel ore, limonite, fossil type reductants, biomass type reductants*