

## Reaksi karbotermik nickeliferous sintetis dengan campuran batubara subbituminous dan sulfur kadar tinggi = Carbothermic reaction of synthetic nickeliferous with mixture of subbituminous coal and high sulfur content

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### Abstrak

Dengan banyaknya konsumsi nikel dunia, peningkatan konsentrasi nikel dapat dilakukan dengan reduksi selektif bijih nickeliferous. Penelitian ini bertujuan untuk mengetahui pengaruh tingginya kadar sulfur dan pengaruh waktu milling terhadap reduksi selektif dan nilai recovery nikel dan besi. Sampel didapatkan dengan mencampurkan nickeliferous sintetis, subbituminous, dan sulfur dengan proses milling kemudian direduksi. Fraksi yang bersifat magnet yang diperoleh dari proses pemisahan magnetik sampel hasil reduksi kemudian dilakukan uji AAS untuk menentukan nilai recovery nikel dan besi. Pada variasi penambahan sulfur, nilai recovery nikel dan besi tertinggi berada pada sampel dengan penambahan 34,5% sulfur. Sedangkan pada variasi waktu milling, nilai recovery nikel dan besi tertinggi berada pada sampel dengan penambahan 52% sulfur dan di-milling selama 20 jam. Pada hasil XRD, jenis sampel yang di-mortar masih dideteksi adanya senyawa SiO<sub>2</sub> serta semua jenis sampel tidak terdeteksi senyawa ferronickel (FeNi). Dari hasil pemetaan EDS, hampir semua jenis sampel memperlihatkan senyawa nikel sulfida (NiS).

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With so many world nickel consumption, increased concentration of nickel can be done by selective reduction of nickeliferous ore. This study aims to determine the effect of high sulfur content and the influence of milling time on the selective reduction and recovery of nickel and iron. Samples were obtained by mixing synthetic nickeliferous, subbituminous, and sulfur in the milling process and then carried out a process of carbothermic reduction. The magnetic fraction which obtained by magnetic separation of reduction sample is conducted to AAS to determine the recovery of nickel and iron. On the variation of addition of sulfur, the highest recovery of nickel and iron on the sample with the addition of 34.5% sulfur. While the variation of milling time, the recovery of nickel and iron are highest on the sample with the addition of 52% sulfur and milling for 20 hours. In the XRD results, the type of sample that mixed in the mortar still detect the presence of SiO<sub>2</sub> compounds and all types of samples are not detected compounds of ferronickel (FeNi). The results of EDS mapping, almost all types of samples showed the compounds of nickel sulfide (NiS).