

# Proses karbotermik proses dari pig iron nugget menggunakan bijih besi kadar rendah asal indonesia = Carbothermic process of pig iron nugget using low grade iron ore from indonesia

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## Abstrak

Inovasi terhadap memproses bijih besi sangat banyak. Dalam proses reduksi, banyak orang cenderung memilih bijih besi kadar tinggi. Di Indonesia, bijih besi yang ada memiliki kadar rendah. Dibutuhkan perhatian khusus agar dapat memproses bijih besi ini. Dengan memanfaatkan bijih besi asli Indonesia, kita dapat meningkatkan perekonomian Indonesia. Bijih besi asal Lampung di reduksi dengan memanfaatkan batu bara yang juga berasal dari Indonesia Kalimantan . Proses reduksi dilakukan dengan memvariasikan temperatur dan waktu. Sampel yang sudah dicampur batu bara, bentonite, dan  $\text{CaCO}_3$ , dimasukkan kedalam furnace sampai temperatur yang diinginkan. Setelah sampai pada temperatur yang diinginkan, temperatur ditahan sesuai waktu yang telah ditentukan. Setelah proses reduksi selesai, produk diteliti dengan menggunakan SEM, XRD. Berdasarkan tes XRD, keempat produk sukses membuat metallic iron. Derajat reduksi akan meningkat dengan semakin naiknya temperature. Namun hal ini masih bergantung pada hasil yang didapatkan. Derajat metalisasi sudah sesuai dengan literatur. Semakin naik temperatur, derajat metalisasi semakin bertambah. Yield of metallic iron juga sesuai dengan literatur. Semakin naik temperatur, Yield of metallic semakin bertambah. Mikrostruktur menghasilkan hasil yang seragam, kecuali pada temperature 1400 C dan temperature 30 menit. Waktu dan temperature nampaknya tidak cukup untuk mereduksinya.

.....There are many innovations in processing the iron ore. In the reduction process, many people tend to choose high grade iron ore. In Indonesia, the existing iron ore has low grade. Special attention is required in order to process this iron ore. By utilizing the native Indonesian iron ore, we can improve the economy of Indonesia. We use iron ore from Lampung in the reduction by utilizing coal which is also from Indonesia Kalimantan . The reduction process is done by varying the temperature and time. Samples that were mixed with coal, bentonite, and  $\text{CaCO}_3$ , is inserted into the furnace to the desired temperature. Having reached the desired temperature, we hold the temperature in accordance with the predetermined time. After the reduction process is complete, we examine the product using SEM, XRD. Based on XRD tests, four products successfully make metallic iron. The degree of reduction would be increased with the rise of temperature. However, it is still dependent on the results obtained. Metallization degrees are in accordance with the literature. With the increase of temperature, the degree of metallization also increase. The yield of metallic iron is also in accordance with the literature. With the increase of temperature, the increasing yield also increase. All product produce the same microstructure, except for temperatures of 1400 C and holding time 30 minutes. Time and temperature does not seem enough to do the reduction process.