

عنوان مقاله:

An Investigation on the Reduction of Iron Ore Pellets in Fixed Bed of Domestic Non-Coking Coals

محل انتشار:

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خلاصه مقاله:

In this study, the isothermal reduction of iron oxide pellets, made of Iranian Chadormalo, Gole-gohar, and Sangan iron ores, was investigated in the temperature range of ۹۰۰-۱۱۰۰°C. Tabas, Pabdana, Babnizoo, Karmozd, and Shahrood domestic coals were used as reductants. Parametric studies were performed and the effects of such factors as temperature, average particle size of iron ore and coal fines, pellet size, and BaCO₃ additive on reduction process were investigated. It was found that both the rate of reduction in the early stages of the process and overall reduction increased for all the iron ores used with increasing temperature. Overall reduction, however, decreased when the size of Sangan iron ore pellet increased. It was also observed that the rate of reduction decreased when the particle size of Sangan iron ore fines increased at the early stages of the process but increased thereafter during the process. The rate of reduction and the overall reduction in Sangan iron ore also increased considerably when BaCO₃ was added to Tabas coal at ۱۱۰۰ °C. Finally, a kinetic study was performed for reduction of Sangan iron ore using Tabas coal to determine the activation energy of the reduction reaction. It was found that the activation energy decreased from ۱۵۹ to ۰.۱۳۳ kJ/mol by increasing the BaCO₃ content from ۰% to ۵%.

کلمات کلیدی:

Iron ore, Pellet, Direct reduction, Coal

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