

عنوان مقاله:

The Layered Reduction of Hematite (Iron Oxide) Ore by Non-Coking Coal: The Effect of Calcium Carbonate on Reduction

محل انتشار:

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خلاصه مقاله:

Due to the abundance of the non-coking coal and limitations as well as the high costs of the natural gas, the present study examined the direct reduction of hematite (iron oxide) ore in the temperature range of 800-1000 °C by the non-coking coal volatiles. Approximately, ۷۴.۹% of the total amounts of volatiles and gases exit the coal up to 800°C. The onset temperature to exit volatiles from the non-coking coal was approximately ۵۲۵°C. The SEM micrographs and XRD results indicated the non-uniform layered reduction of the hematite layer. As temperature was increased, the reduction of hematite ore was increased. At a constant temperature of ۱۰۰۰°C, the reduction rate of the hematite layer reached a maximum after ۳۰ min and then it was decreased. Adding various amounts of calcium carbonate to the non-coking coal in optimal reduction conditions increased the reduction rate of the hematite ore. The optimal (concentration of this catalyst was ۵ wt% (relative to the coal

کلمات کلیدی:

Direct reduction, Iron ore, Non-coking coal, Calcium Carbonate

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