

# 1 - 1 APPROACH TO NEW IRONMAKING PROCESSES WITH ADVANCED COAL TREATMENT

Key words : Self-Reduction., Rapid Reduction, Carbon Composite Iron Ore, Hot Briquetting, Melting, Blast Furnace, Smelting Reduction Process

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The rapid self-reduction method of iron ore with iron ore and coal mixture has been developing in some steel companies for energy saving, protection of environments and effective use of iron ore and coal resources. The key technologies in industrial use of this method were the manufacturing of a high strength and a high density carbon composite iron ore briquettes.

In this researches, the hot briquetting method of ore and coal mixture was developed by using the thermo-plasticity characterization of coal at 500-600 . The carbon composite iron ore formed by this method showed around 1000N/piece in strength and five times or more of ordinary raw materials in reduction rate. Furthermore, in a smelting reduction test, FeO component in liquid slag flew out from the briquettes was kept under 3mass%. These physical and chemical properties of the iron ore briquettes bonded by the coal present the possibility of greatly revolutionizing the ironmaking processes.

This paper presents the mechanism of self-reduction of carbon composite iron ore, hot briquetting method by using coking coal, physical and chemical properties of the briquettes and the applicability of them to the blast furnace and the smelting reduction process.

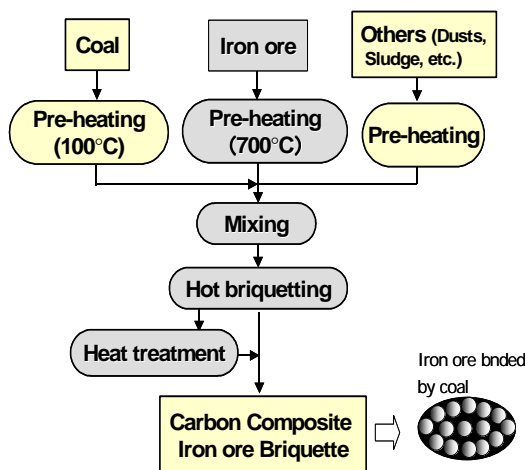


Fig.1 Bonding method of iron ore by coal.

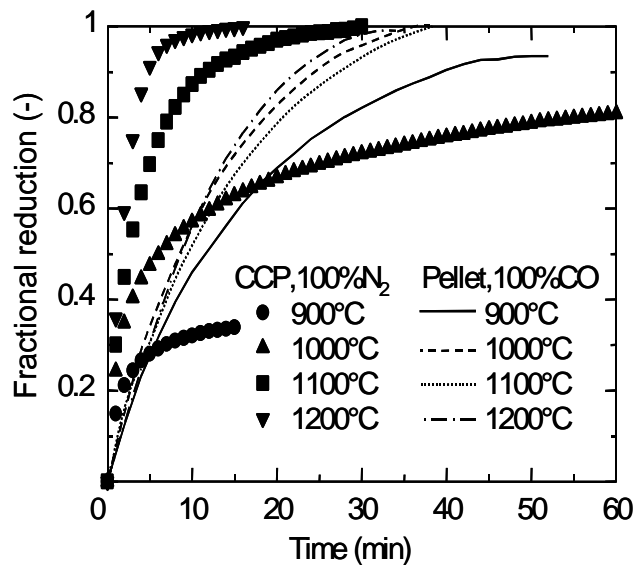


Fig.2 Reducibility of carbon composite iron ore(CCP) relating to ordinary pelles.