Contribution ID: **439** Type: **Poster Presentation**

Effect of slag conditions on the wetting behavior between blast furnace slag and cokes

Tuesday 7 October 2025 19:21 (1 minute)

To reduce CO2 emissions during blast furnace operation, the usage of pellets is increasing compared to sintered ore. Pellets melt at higher temperatures and have superior reducibility compared to sintered ore, which allows for a reduction in coke consumption. However, due to differences in composition between pellets and sintered ore, the Al2O3 content in blast furnace slag is increasing. Additionally, as high-grade iron ore is being depleted and its cost is rising, the use of medium- and low-grade iron ore with high Al2O3 content is expanding, leading to a rapid increase in Al2O3 content in slag. Changes in slag composition affect not only the burden descent behavior in the blast furnace but also internal heat transfer. In the lower part of the blast furnace, a coke bed exists, and the slag must pass through this layer to reach the lower zone. However, if the wettability between slag and coke is poor, slag may not descend smoothly, blocking the coke bed and hindering the upward flow of reducing gas. This can negatively impact heat transfer efficiency and operational stability in the blast furnace.
Therefore, this study aims to evaluate the effect of slag compositions, such as Al2O3 content, basicity (CaO/SiO2) on wetting behavior. To achieve this, CaO-SiO2-Al2O3-MgO-FeO quinary slag samples were prepared with varying basicity (CaO/SiO2) and Al2O3 content. Wettability between slag and coke was observed at 1550℃ under a CO-N2 gas atmosphere, and the contact angle was measured using a commercial software. Through this study, the influence of blast furnace slag composition on wettability was investigated, and appropriate operational conditions may be proposed to enhance the stability and efficiency of blast furnace operations.

Primary authors: Mr SHIN, Hyeonwoo (Dong-A University); KANG, youngjo (Dong-A University)

Presenter: Mr SHIN, Hyeonwoo (Dong-A University)

Session Classification: Poster Session

Track Classification: Ironmaking - Blast furnace ironmaking