Contribution ID: **345** Type: **Oral Presentation**

Sodium silicate impacts on blast furnace operation.

Wednesday 8 October 2025 11:10 (20 minutes)

This study explores the main differences between Na and K on the Blast Furnace operation focusing on the effects of Na_2SiO_3. The experimental method involved simulating thermodynamic parameters comparing traditional alkalis oxides, carbonates and silicates. In addition, a technological apparatus was used to describe slag properties and gangue phases at high Na content. The results indicated that differently from Na and K oxides and carbonates, Na2SiO3 compound is completely stable in blast furnace atmosphere which promotes low probability for reducing this compound to Na vapor. Furthermore, the study investigated Na vapor adsorption by iron-containing burdens. Sodium was vaporized from Na_2CO_3 and Na_2SiO_3 at 1200℃, and the results showed that Sodium was adsorbed by sinter and pellet samples from Sodium Carbonate, but not from Sodium Silicate. In addition, It was observed Na2SiO3 compound could be removed by the slag with typical chemical parameters of a Blast Furnace. Finally, the slag physical chemical properties was not affected by Na_2SiO_3 addition as seen, the slag viscosity decreased when increase Na content via sodium silicate compound.

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Session Classification: Burden Materials & Quality

Track Classification: Ironmaking - Blast furnace ironmaking