Contribution ID: **14** Type: **Oral Presentation - Presentation will be held without submitting a Full Paper**

The potential of selective adjustments to the suction gas in iron ore sintering to reduce greenhouse gas emissions

Wednesday, 21 May 2025 09:10 (20 minutes)

European steel companies are endeavoring to switch to direct reduction plants and will do so in the coming years, although primary steel production in Europe is currently still conducted exclusively in integrated steelworks. The ferriferous feed material is mainly produced in sinter plants for the blast furnace, with waste gas recirculation representing the current state of the art. For infrastructural reasons, the transition from the blast furnace route to direct reduction plants can only take place gradually, so that these two production routes will coexist and potential synergies can be exploited. For example, an increased use of oxygen as a by-product of electrolysis is possible. In addition, new types of metallurgical waste gases, exemplified by those derived from direct reduction plants, can be used. For these reasons, the sinter process is facing a transformation to meet future challenges and therefore a more profound understanding of the potential influence of the individual constituents, in particular O2, CO, and H2O, in the suction gas is essential. Within this paper miniaturized lab scale sinter experiments are presented using an industry like raw mixture to study the effects of individual O2 , CO and H2O variation on the sinter process and sinter quality. As the O2 content (up to 30 vol.%) in the suction gas increases, both the sintering yield and the strength increase resulting in lower return rates, with more or less constant amounts of CO in the off gas. Productivity and sintering strength increase with increasing CO concentration, while NO concentrations in the exhaust gas tend to be lower. With increasing moisture, productivity and sintering strength increase with significantly lower CO concentrations in the off gas, due to the water-gas shift reaction taking place in the flame front. The results show potential for adjusting the recipe of the raw mixture by selectively adjusting the suction gas, in particular towards a lower coke breeze content, which would enable a reduction in the specific emissions of CO and CO2 per ton of product sinter.

Speaker Country

Austria

Are you interested in publishing the paper in a Steel Research International special issue?

No

Primary author: Dr EISBACHER-LUBENSKY, Jan (Chair of Ferrous Metallurgy, Montanuniversität Leoben)

Co-authors: Mrs PICHLER, Sigrid (Chair of Process Technology and Industrial Environmental Protection, Montanuniversität Leoben); Mrs SCHLEMMER, Nina (Chair of Process Technology and Industrial Environmental Protection, Montanuniversität Leoben); Prof. WEIß, Christian (Chair of Process Technology and Industrial Environmental Protection, Montanuniversität Leoben); Dr BÖBERL, Michaela (Primetals Technologies Austria GmbH)

Presenter: Dr EISBACHER-LUBENSKY, Jan (Chair of Ferrous Metallurgy, Montanuniversität Leoben)

Session Classification: CO2 mitigation in iron and steelmaking

Track Classification: CO2 mitigation in iron and steelmaking