

Green Alloys: Modelling Better Approaches

Publieke samenvatting / Public summary

Aanleiding

The iron and steel industry are confronted with pressing challenges. Historically, the industry has heavily relied on carbon-intensive blast furnaces for iron-ore reduction, contributing significantly to greenhouse gas emissions. However, with global sustainability goals and stricter environmental regulations, there's a growing urgency for innovation.

Doelstelling

Tata Steel in the Netherlands is dedicated to revolutionizing iron manufacturing by transitioning from coal to gas-based direct reduction processes (DRI), utilizing hydrogen. This approach promises a substantial reduction in carbon emissions compared to traditional blast furnace methods, aligning with the industry's commitment to environmental responsibility.

Korte omschrijving

To achieve the goals, it is imperative to understand the intricate chemical reactions occurring on the iron surfaces during the direct reduction process. This understanding is crucial for ensuring controlled product quality and throughput. Inconsistencies can lead to inefficiencies, increased energy consumption, and lower product quality, which the steel industry can ill afford.

Resultaat

Our project focuses on developing accurate particle models, validated through experiments, and scaling it up to a comprehensive process model. This model will simulate industrial direct reduction shaft furnace

Projectinformatie / Project information

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Algemene informatie / General information

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processes under various operating conditions, including temperature, pressure, pellet chemistry, and gas composition when transitioning from natural gas to hydrogen based DRI production.

De data in deze applicatie is afkomstig van de Rijksdienst voor Ondernemend Nederland (RVO) en wordt in samenwerking met de Topsector Energie ontsloten.

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