

CO₂ utilisation integrated with HIsarna and prepare demonstration

Publieke samenvatting / Public summary

Aanleiding

The HIsarna process is a breakthrough process for the cost effective production of iron whereby CO₂ can be capture with minimum cost. Iron is produced in a reduction vessel combining the CCF and HIs melt Technologies which uses nearly pure oxygen, therefore producing high temperature off gases which contain more than 90% CO₂. The high temperature and the high concentration of CO₂ makes this ideal to utilise this CO₂ towards the production of syngas. One of the possible applications of syngas is the production of aviation fuels via the Fischer Tropsch process. Syngas can be produced with an electrochemical process (called co-electrolysis), whereby oxygen is simultaneously produced. This oxygen can be directly used in the HIsarna process itself.

Doelstelling

- Validate the suitability of the off-gases from the HIsarna process as feedstock to the co-electrolysis process to produce syngas and oxygen - Develop the integration scheme for the electrolysis process to the full-scale HIsarna process - Use the pilot data of the co-electrolysis process to validate the techno-economic evaluation

Korte omschrijving

Phase 1: Integration Assessment of the potential for the integration of an advanced co-electrolysis process with the HIsarna process. Phase 2: Validation by pilot plant operation Determining operating window co-electrolysis in pilot plant

Projectinformatie / Project information

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TCCU218008

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Algemene informatie / General information

Penvoerder / Secretariat
Tata Steel Nederland Technology B.V.

Publicaties en materialen / Publications and attachments

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Eindrapport TCCU218008

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operation using Hlsarna off gases Phase 3: Prepare for demonstration Provide recommendations for the implementation of the pilot plant scale demonstration at Tata Steel IJmuiden Phase 4: Technical-economic evaluation Based on a scale-up study, determine the techno-economic evaluation to provide the CAPEX and OPEX for the large scale demonstration and integration of co-electrolysis process to the Hlsarna. An active dissemination strategy will be followed, leading to publications in peer and non-peer reviewed journals.

Resultaat

The main results are to provide sets of validated pilot plant based performance measurements for the co-electrolysis system and the subsequent techno-economic evaluation for its integration to the Hlsarna process. To assess the techno-economic potential of the different uses of the syngas will be taken into account (e.g. Fischer Tropsch towards jet fuels). Moreover, a gap-analysis and a technical roadmap towards large scale demonstration will be made.

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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