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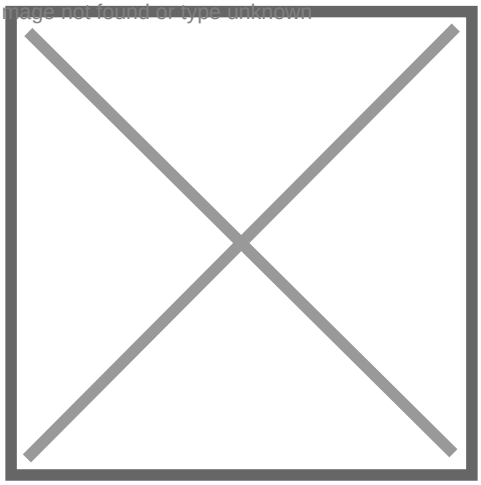

HORIZON-CL4-2022-TWIN-TRANSITION-01-15

HYPER

Full Title: An electrochemically produced oxidiser for modular, onsite generation of HYdrogen PERoxide

Aim:

The main objective of HYPER is the demonstration, in industrially relevant environments, of a scalable, modular electrochemical process for H2O2 production with improved efficiency compared to the state-of-art. It will bridge this production with downstream integration into diverse value chains, pulp and paper, textiles and coatings/chemicals, in which strong market opportunities exist for modular, on-site and on-demand H2O2 production. HYPER will thus help transform H2O2 production from a large-volume, energy intensive chemical process to a smaller-scale, modular, renewable, electrochemical process.

Concept:
The central innovation in HYPER is the use of persulfate as a stable oxidization intermediate, allowing both storage of renewable electricity and on-demand H2O2 production. Demonstration of electrochemical production technologies at TRL6 and integration into the three aforementioned value chains will allow HYPER to evaluate the potential of the electrochemical production for further TRL development.HYPER will advance a safe, circular, and cost competitive electrified technology for H2O2 production. The estimated production price of ca. 0.6 €/kg can be further decreased by the storage of renewable electricity. Implementation of HYPER technology will decrease life cycle CO2 emissions in H2O2 production by up to 75% when 100% renewable energy sources are used. Estimated CO2 emissions reductions are from 1.1 Mt CO2/yr in 2030 to 1.4Mt CO2/yr in 2045, for cumulative CO2 emission savings of more than 19 Mt by 2045. Energy consumption of the HYPER process are

estimated to be over a third less than the established production route.

Start date:
01/01/2023

End date:
31/12/2026