DIgital twin of a VACuum based heat battery

Publieke samenvatting / Public summary

Aanleiding

Despite the successful demonstration of closed and closed-loop heat batteries within MMIP-IEBB (projects 9.3 and 9.4), there is a knowledge gap on the aging of TCM and the resulting effects in the performance of the heat battery over lifetime.

Doelstelling

Divac advances the state-of-the-art knowledge on the TCM behavior by conducting in-situ experiments in an advanced mico-CT scanner and developing a digital twin of the heat battery. The objective is to design a stable and optimized reactor by considering the aging effect of TCM.

Korte omschrijving

UT will investigate the effect of interaction between TCM particles and heat exchanger using the extension of an already available model developed within ME4TES project, thereby developing a digital twin of the vacuum system. Based on this investigation and with the support from Saxion an optimized reactor will be designed by ARES. ARES will re-design the test set-up of ME4TES project, the smallest repeating unit including 2 fins of heat exchanger with heat transfer fluid passing through. This set-up will be scanned in a micor CT-Scanner, allowing to monitor and quantify the volume change of particles. To understand and measure the interaction of TCMs with the system, ARES will design a setup that simulates typical heat exchanger/ reactor system considering the heat and mass transport of a given TCM. The data from in-situ measurements and model will be used to improve the design and develop design calculator software

Projectinformatie / Project information

Projectnummer / Project number
TKITOE2121403
Subsidiebedrag / Grant amount
€ 358.333,00

Algemene informatie / General information

Penvoerder / Secretariat
UT

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by Saxion.

Resultaat

Divac provides insight into the aging effect of TCM over the lifetime of a thermochemical heat storage system. The project results in design parameters for the production process of thermochemical heat storage with Na2S. Finally, an optimized reactor is engineered based on the generated knowledge in this project.

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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