Tunable Composite Salt Hydrates for Thermochemical Heat Batteries

Publieke samenvatting / Public summary

Aanleiding

Compact and scalable heat storage is an essential component of the energy transition. This is now being acknowledged by the government and energy experts. Therefore, the development of disruptive materials and systems implying clean and renewable energy resources is of utmost importance to address major societal concerns, such as global warming.

Doelstelling

The SALTECH project is aiming to leap forward small- and large-scale thermal storage (MMIP4:1&3) technologies by introducing cost effective tenable composite TCMs combined with modular thermochemical energy storage (TCES) system with high flexibility and storage capacity. The SALTECH targets an energy density of more than 1 GJ/m3 (on system level), with cyclic stability of more than 500 cycles for future TCES systems.

Korte omschrijving

By completing the following tasks, the SALTECH will provide game-changing technologies by providing cost effective tunable composite TCMs with enhanced diffusion characteristics, superb energy density, chemical stability, high thermal conductivity, and cyclic stability for future small- and large-scale heat storage systems: - A novel approach will be taken in account to minimize multiscale effects and preserve the inherent properties of TCMs by utilizing advanced characterization methods such as 4D kinetic study

Projectinformatie / Project information

Projectnummer / Project number
TKITOE2021402
Subsidiebedrag / Grant amount
€ 400.000,00

Algemene informatie / General information

Penvoerder / Secretariat
Universiteit Twente

Publicaties en materialen / Publications and attachments

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to achieve a deep understanding of macro and microscopic properties of salt hydrates. - The facile and large-scale synthesis method of tunable composite TCMs will be established by considering membrane technology to offer advanced opportunities to have full control on permeability, size, and geometry of particles to mitigate the diffusion limitations of salt hydrates. - A conceptual design of SALTECH heat battery module by incorporating developed materials inside will be tested and optimized considering safety and cost analyses.

Resultaat

The SALTECH project will develop new class of composite thermochemical materials that can be specifically tailored to suit needs for desired applications. This provides cheaper, smarter, and more efficient heat battery that helps to achieve the MMIP4 program goals.

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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