

Master's Thesis Assignment:

Performance and Operation Analysis of a Heat Battery Prototype with an Advanced Reactor Design

Project Type

Prototype Testing (Lab Scale)

Project Description

According to the International Energy Agency, the building sector is the world's largest energy consumer, accounting for roughly 40% of global primary energy consumption and 24% of global CO₂ emissions. In addition to electricity, space heating and hot water supply play a considerable role in the energy consumption of residential buildings. Thermochemical energy storage is a great tool to provide an excellent remedy for correcting the mismatch between supply and demand in the energy sector in a cheap way. Excess energy can be stored during hours when resources are available and retrieved for power production when it is needed.

Research Objectives

Our research group has already built and tested a novel design battery prototype in our lab (please see the figure). The primary objective of this study is to analyze the performance of the prototype thermochemical heat battery system by operating it in different operating conditions. The specific goals of the study are:

- Operating the battery prototype in different settings to verify the reliability of the system.
- Examining the effects of various operating parameters, including temperature differentials, charging and discharging rates, on the overall performance of the system.
- Investigating the system's cycling behavior, focusing on stability and degradation over multiple charge-discharge cycles.

What is expected from you?

- You have a background in Mechanical or Chemical Engineering, Applied Physics, SET or others.
- You are willing to learn to develop prototypes to test systems for cutting-edge technology.
- You are interested in working in the lab with a hands-on approach.

What we offer?

- A collaborative and creative working environment in which you learn a lot from it and can put your ideas into practice.
- Learning from experienced researchers to develop prototype setup

Contact information

If you would like to know more details, please don't hesitate to email Zeynep Uykun (z.uykun@utwente.nl)

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