

Bachelor's / Master's Thesis

## Characterization of an additively manufactured heat pipe cooled methanation reactor

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### Contents:

Future carbon neutral mobility requires liquid energy carriers. Chemical catalytic raw methanation of syngas from biomass can play a crucial role in achieving carbon neutral transport. However, tars and other problematic substances are created during thermochemical gasification of biomass, which require costly gas cleaning. The chair of Energy Process Engineering is researching a new process, which allows tar reforming to occur at the same time as methanation, greatly reducing process complexity. To achieve this goal, our current ADDmeth reactor, which is an additively manufactured methanation reactor that is cooled using heat pipes will be remodeled.

This thesis will examine different operating points and characterize the behavior of the existing ADDmeth1 reactor. Studying the influences on the reactor's behavior will lay the foundation for all future works on the new design. The thesis will consist of very practical work and allows you to really understand the variables in reactor operation and their influence on the behavior.

### Tasks:

- Literature research on the task
- Planning and conducting experiments to study the operating behavior of the ADDmeth1 reactor
- Written documentation of the work, clearly shown overview of the results and a presentation

### Prerequisites:

- Interest in theoretic and practical work
- Creativity, personal initiative and an independent way of working

**Start of work:** from April 2023

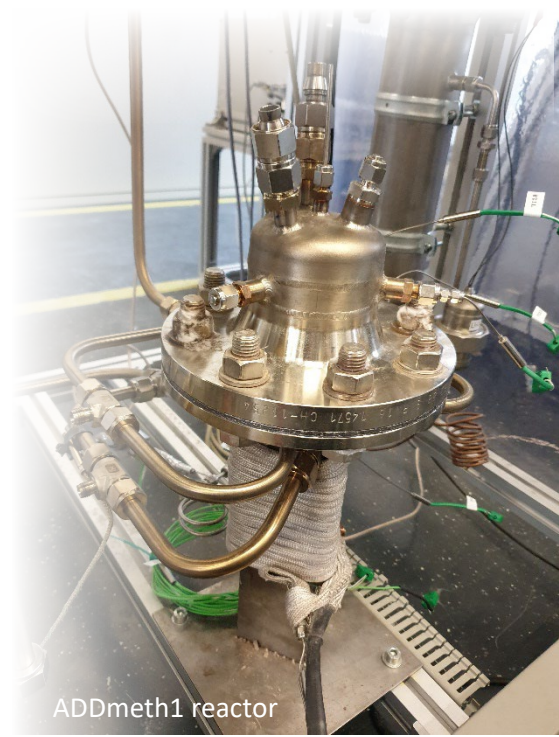


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ADDmeth1 reactor