

## Announcement for Bachelor Thesis

# Pump Control for an LOHC Dehydrogenation Reactor

### Motivation

In times of climate change, a transition to renewable energies is taking place. One promising energy carrier in this context is hydrogen. To avoid its disadvantages in store and transportation, Liquid Organic Hydrogen Carrier (LOHC) technology is under constant development. In this process, the hydrogen is chemically bound into the LOHC (hydrogenation) and dissolved out again before further use (dehydrogenation).

In chemical processes, the precise setting of control variables such as temperature, pressure and volume flow is a central problem. Due to various disturbances, subordinate control systems are generally used for the individual control variables.



Quelle: <https://hi-ern.de/hi-ern/h2Storage>

### Task description

In this thesis, a pump control for the LOHC volume flow of a dehydrogenation reactor is to be designed. For this purpose, a modeling of the metering pump and the connected structure is to be carried out and implemented in Simscape. The fluid properties and temperature changes in the system are to be explicitly taken into account. Based on the model found, suitable controller design methods are selected and applied. The designed controllers will then be simulatively tested and finally critically evaluated and compared with each other.

### Requirements

- Knowledge of control engineering
- Experiences in MATLAB / Simulink / Simscape

Note that the thesis can be written in either English or German.

### Contact

Alexander Verhoolen, M.Sc.  
Chair of Automatic Control  
[alexander.verhoolen@fau.de](mailto:alexander.verhoolen@fau.de)