

Master Thesis

Modelling of adsorption heat pump cycles

Research Group and Project

One research focus of the Institute for Fluid Machinery (FSM) is systems for heat and cold supply in buildings comprising renewable energies. In this context, advanced adsorption heat pump cycles are being investigated through simulations and experiments. Existing research has mainly focused on water as the working fluid. However for use in heating applications involving source temperatures below 0 °C, the use of other working fluids, especially methanol, appears promising. The objective is to develop a model for a (simplified) static adsorption cycle with methanol as a working fluid.

Topic

Models for static adsorption cycles with water as the working fluid, where the total heat of adsorption and desorption is computed, without considering the rate of mass and heat transfer, have already been developed. The aim of the project would be to extend these models to allow the use of other working fluids, particularly methanol.

Definition of the Project (modifications are possible)

- Familiarisation with thermodynamics of adsorption cycles
- Literature survey of the differences in adsorption cycles based with methanol vs. those with water as working fluid
- Adaptation of existing models to use working fluids other than water
- Implementation of a thermodynamic property routine for methanol
- Thesis can be written in either German or English

Requirements

- Student in the field of mechanical engineering/ process engineering
- Working knowledge of programming in MATLAB and/or C
- Knowledge about adsorption or other thermodynamic cycles (optional)

Start Date

As soon as possible

Contact

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