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Subject Area	Thermal process engineering
Project Partner	IET, Rapperswil, SG



Simon Hasler

Optimization of a plant for methanol synthesis

Implementation of a heat exchanger

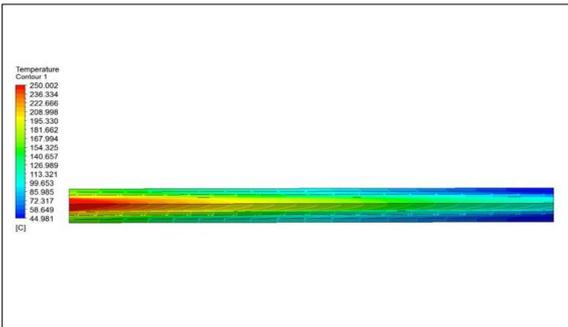


Methanol test plant

Introduction: In order to find a way to create a renewable energy carrier that is used to store electric energy a test plant for methanol synthesis was developed at the HSR Hochschule für Technik Rapperswil. The synthesis is taking place by using hydrogen and carbon dioxide. Its energetic efficiency is 26%.

Objective: The aim of this bachelor's thesis is to increase the energetic efficiency of the test plant to > 50%. In order to achieve this aim the test plant has to be analysed first. Secondly a measure for optimization has to be designed.

Procedure / Result: In order to increase the energetic efficiency, the calculation of the energetic efficiency must be understood. In the next step, the plant is examined for energy losses by using an Aspen process simulation. Finally, a double-tube heat exchanger designed by a CFD simulation in Ansys is implemented as an optimization measure.



CFD simulation of the heat exchanger



Assembly of optimized plant (with heat exchanger)