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Experimental Investigation Of Evaporation And Condensation Of Hydrocarbon Mixtures In Plate Heat Exchangers

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Utilization of natural working fluids such as hydrocarbons can reduce green house gas emissions considerably. However, components and systems need to be developed further to fully exploit their thermo-physical properties.

A new heat exchanger test rig is under construction at SINTEF Energy Research's thermal laboratories. This rig is designed for testing of novel heat exchanger concepts and designs for hydrocarbons and mixtures of these. Heating, cooling, evaporation and condensation experiments can be performed at temperatures from 0 – 150 °C and pressures up to 70 bar(g).

In the first experiments, evaporation and condensation of a hydrocarbon mixture with a temperature glide is investigated. Evaporation and condensation are conducted in the same plate heat exchanger with the same operational parameters. Results from the experiments will be compared to simulation models of the heat exchanger.

This paper gives a description of the experimental rig, methodology and results from the performed heat exchanger testing.