

Viscosity-Control Demonstrator

Today, industry relies on classic viscosity measurement in many areas. With this method, the viscosity is determined outside the actual process cycle. To do this, the process liquid first must be removed manually. Only then the desired measurement can be carried out. This process takes a lot of time and there is no online viscosity check. In the future, these measurements are to be carried out more "inline". The viscometer is located within the process cycle. The aim of this work is to show that a stable viscosity control of different fluids is possible with the inline viscometer of the industrial partner. This is done through practical tests in a suitable test environment.

For this, a typical industrial process cycle was scaled down, planned and set up. A previously created simulation model of the process cycle could be validated by means of suitable tests. The simulation could then be used to test the control parameters for a stable PID control of the viscosity in the circuit. The control parameters are determined by a previously carried out system identification of the real test setup based on the step response. The same, simple methodology can be applied to any working point of different fluids.

The practical tests have shown that the measured values of the viscometer are sufficient to implement a stable PID viscosity control in an industrial process circuit. In order to increase the dynamics of the controlled system, the design method for determining the PID parameters could be improved. For a system identification suitable for industrial use it would have to be possible to determine these parameters automatically.



Diplomand
Simon Keller

Dozierende
Daniel Fehr
Mathias Bonmarin



Experimental Setup