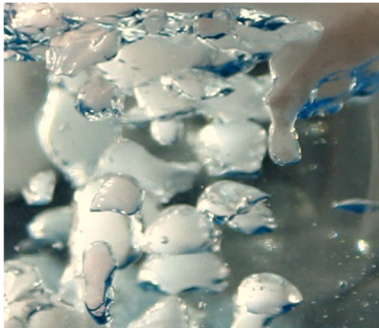


Master Thesis

Start 2017

Duration 6 Months



Model evaluation for the calculation of mixing rules and application in the flow through throttling devices

Vessels, fittings and equipment of many industry production processes sector are based on mixtures of multiple compounds and multi-phase streams. During the emergency relief of pressure systems with two-phase multi-component mixtures, the safety devices (e.g. safety valves and rupture discs) should be accordingly sized. During the pressure relief through these devices, thermodynamic, mechanical and the chemical non-equilibrium between the species may arise, which have a certain impact on the calculation of the mass flow rate and pressure drop.

Approach

1. Literature study of mixing rules for the prediction of the thermodynamic properties of mixtures.
2. Evaluation of phase-equilibria equations of state for the calculation of typical industry mixtures.
3. Physical investigation of the mass transfer phenomena between the gas and the liquid phase in multi-component flows through nozzles.
4. Development of an appropriate model, considering the non-equilibrium phenomena for the calculation of the mixture volume.
5. Research of experimental values for the evaluation of the model.

This master thesis takes part within the framework of the international project **Multiflash**, to investigate the non-equilibrium phenomena of flashing multi-component two-phase flows through safety devices under critical flow conditions.

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TOPICS: Thermodynamics, Fluid mechanics, two-phase flow, Modelling...