



2 Master Theses

„CFD Simulations of Gas/Liquid and Liquid/Liquid Flow in Mixing Elements“

The ultimate goal of these Master Theses are database containing geometric models for gas/liquid (G/L) and liquid/liquid (L/L) reactor mixing elements. These geometric models should be characterized via CFD simulations, such that their selection according to predefined synthesis conditions is possible. Additionally, an approximate model that describes the flow (e.g., the mean speed in the device) in these mixing elements should be established.

Based on the results of the CFD simulation studies, advanced G/L and L/L reactor elements will be prepared, and evaluated in the laboratory (this experimental work is not part of the theses). Based on the outcome of these evaluations, additional simulations should be performed, and results should be compared with experimental findings.

The objectives of this work are:

- **Performing benchmark** simulations of gas/liquid flow and **evaluation** of the results against literature data (literature survey partially available)
- **Evaluation of** existing G/L and L/L mixing elements (based on simulation) with respect to their suitability for different flow regimes
- **Design** of new, advanced G/L and L/L mixing structures to be fed into the model database
- **Comparison** of the simulation output with experimental data for selected geometries

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Contact: Stefan Radl (radl@tugraz.at, 0316 873 30412)