Karlsruher Institut für Technologie

Karlsruher Flüssigmetalllabor

Institut für Thermische Verfahrenstechnik

Characterization of a bubble column for sodium evaporation
Charakterisierung einer Blasensäule zur Natriumverdampfung

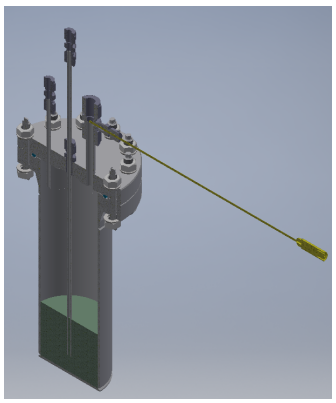
Master thesis (theoretical/experimental)

Beginn: immediately

Chemieingenieurwesen/Verfahrenstechnik, Maschinenbau

Themenstellung:

This work will be carried out as part of the NAMOSYN project, in which an experimental setup for anhydrous formaldehyde production is being designed and built. The dehydrogenation of methanol to formaldehyde takes place in the gas phase using sodium vapor as the catalyst. The water-free formaldehyde can then be used for the production of OME (oxymethylene ether). In order to supply sodium vapor to the reactor, the bubble column has been developed (see figure below). There are many parameters which have to be examined.



In this thesis the following tasks should be dealt with:

- Literature review regarding bubble columns.
- Description of the experimental setup and its handling.
- Influence of pressure and temperature on the required sodium amount (Excel – Solver).
- Comparison of the calculated values with experimental results.
- Errors and uncertainty of measurements in the bubble column.
- Calculation of the parameters for the bubble column - analysis of the flow regime, the height of the bubble column, surface tension.
- Optional: modification of the setup - possible ways to improve the process and scale-up.

The results have to be summarized in a Master thesis (in English) and presented in a seminar.

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