

Bachelor's Thesis

(Experimentell)

Waste-to-X: Investigation of the release of volatiles under pyrolysis conditions from pre-treated residues

Description:

In view of the climate-related resource and energy transition and the high dependence on imports of fossil raw materials, the development of new raw materials, such as biogenic or plastic residues, is of utmost importance. In context of the chemical industry closing the carbon cycle is one key to a sustainable future. One promising option is entrained-flow gasification for the conversion of pre-treated residues into high-quality synthesis gas (H_2 & CO), which can then be converted into electricity in IGCC power plants, for example, or can be used in catalytic syntheses into basic chemicals like methanol.

As the first step of the gasification process, the devolatilization plays a decisive role for the conversion behaviour of the fuel in the gasification reactor. For this reason, the devolatilization is investigated at the Chair of Energy Systems separately from the gasification reaction in a wire-mesh reactor. Thus, various influences such as the influence of temperature, pressure or heating rate can be determined experimentally.

The aim of this work is the experimental investigation of the influence of temperature, pressure and residence time on devolatilization from pre-treated waste. The results are to be compared with the literature and classified in the thesis.

Requirements:

- Enjoy experimental activities
- Independent way of working
- Reliability and personal responsibility

Work Packages:

- Familiarisation with entrained flow gasification, in particular the release of volatiles
- Carrying out and evaluating the experimental investigations
- Documentation of the experimental work and regular discussions with the supervisor

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Contact: M. Sc. Lukas Springmann

Room: MW 3711

Tel.: 089 289 16292

Email: lukas.springmann@tum.de