



University of Stuttgart
Germany

Institute of Combustion and Power Plant Technology
Prof. Dr. techn. G. Scheffknecht

Announcement

**Student Research
Project**

Energy optimization in the preparation of catalytic surfaces for the removal of NO_x from gaseous streams

Background

Control of nitrogen oxide emissions remains a critical problem even as energy production moves along the path of decarbonization. Between increasingly strict limit values to protect the air quality during the energy generation processes in combustion plants to the emissions of NO_x from the cement and steel industries, given their energy intensive nature that makes it hard to easily switch to renewable sources, there is a need to develop better catalytic systems for the control of nitrogen oxides. Currently, the development of catalysts for the selective catalytic reduction with ammonia (NH₃-SCR) that can operate at lower temperatures is an attractive subject. Furthermore, innovative catalysts that have a lower energy and resource footprint are critical, since traditional systems use expensive and/or critical materials and require high temperature processes during their production.

Objective

In this work the optimization of parameters involved in the preparation and activation of catalytic surfaces for the NH₃-SCR reaction will be carried out. An innovative microwave system will be used for this purpose and parameters like temperature, vacuum level, rotation speed and time will be studied.

The catalytic efficiency of the prepared systems will also be compared at laboratory scale, to make decisions regarding the best parameters for the new catalysts.

Approach and tasks

1. Literature review.
2. Experimental preparation of catalyst using microwave technology / catalytic testing.
3. Evaluation of data and optimization.
4. Assessment and compilation of the results.

Requirements

- Interest in technology for emission control
- Able to work independently
- Enjoys practical work as well as chemical analysis
- Very good English or German knowledge

Start date: October 2021

A student assistant job may be offered.

Interested students please contact

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