



Preparation and Assessment of Flatbeds for Testing in Isothermal Flatbed Reactors.

Background:

Testing of solid materials regarding their catalytic activities under process conditions is one of the challenges faced by researchers in heterogeneous catalysis. Thus, laboratory-scale setups used are designed to mimic the industrial applications, while insuring ideal process conditions. In the case of research on the three-way catalytic converters, one of the more sophisticated laboratory reactor models is the isothermal flatbed reactor.



The project:

Aiming for the investigation of structure-property relationships, the underlying project concerns itself with the tailored synthesis of cerium-zirconium solid solutions, the characterization and the testing of these materials. By correlating these material properties to their activity under simulated, transient process conditions in an isothermal flatbed reactor should provide important information on the role of different material properties on the exhaust gas aftertreatment.

Topic of Thesis:

The thesis concerns itself with the preparation, characterization and evaluation of flatbeds using a spray coating procedure. Since mechanical stability and porosity of the prepared bed are highly dependent on the quality of the coating, suitable coating parameters have to be determined first. After stable coatings can be prepared, the implications on the catalytic performance need to be evaluated by comparing the reduction behavior of self-synthesized catalysts to the prepared flatbed of the same catalyst. Lastly, it is necessary to evaluate the stability of the coating under simulated process conditions by hydrothermal aging.

Communication and thesis can be done in German and English!

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