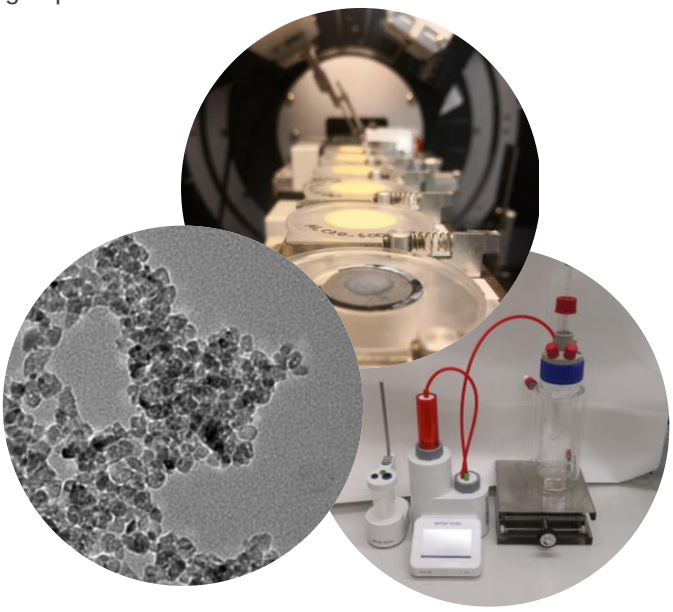
Bachelorthesis
Research Internship
Masterthesis

University of Stuttgart
Institute of Chemical Technology
Prof. Dr.-Ing. Elias Klemm

Systematic Investigation into the Synthesis of Oxygen Storage Materials

Background:

Cerium oxides and materials derived therefrom have attracted interest in many different fields and applications due to their redox activity. Most prominently, they are used as oxygen storage materials in the three-way catalytic converter to buffer deviations in oxygen stoichiometry, thus assuring a good exhaust gas purification.



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. Correlating these material properties to their activity under simulated, transient process conditions should provide important information on the role of different material properties on the exhaust gas aftertreatment.

Topic of Thesis:

Using different synthesis methods and varying synthesis parameters to synthesize cerium-zirconium oxide solid solutions. Consequently, they are characterized using common methods in heterogeneous catalysis research. To analyze their redox behavior, the materials are subsequently tested by means of temperature programmed oxidation and reduction (TPR/TPO), as well as isothermal redox titration. Discussing the results in a comparative manner should shed light onto the underlying structure-property relationships.

Communication and thesis can be done in German and English!

Date: 30.06.2020

If interested and for more information please contact:

Jan Florenski M.Sc.
Mail: jan.florenski@itc.uni-stuttgart.de
Phone: 0711/685-64267
Room: U1-848