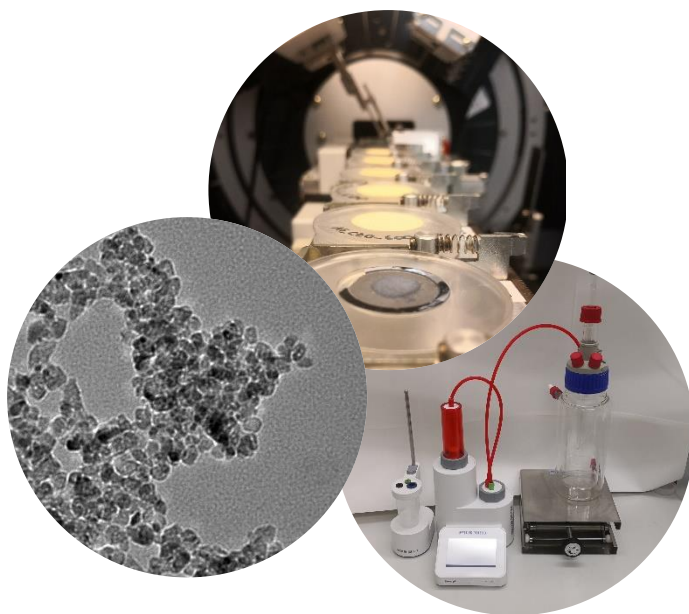




## **Systematic Investigation of Structure-Property Relationships of Ceria-based Materials as Catalysts for CO-Oxidation**

### **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 tailored synthesis of cerium-zirconium solid solutions, characterization and testing of such 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:**

During the thesis cerium-zirconium oxide solid solutions are prepared using different synthesis methods with varying synthesis parameters. Subsequently these materials are characterized using common methods in heterogeneous catalysis research. Redox properties will also be characterized by temperature programmed oxidation and reduction (TPR/TPO), as well as pulse chemisorption. These results are then correlated to measured CO-oxidation activity to shed light on the interplay of material properties and CO-oxidation kinetics.

*Actual topic and working plan is set in correspondence with student.*

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**If interested and for further information please contact:**

**Jan Florenski M.Sc.**

Mail: [jan.florenski@itc.uni-stuttgart.de](mailto:jan.florenski@itc.uni-stuttgart.de)

Phone: 0711/685-64267

Room: U1-848