

## Ce<sub>1-x</sub>Zr<sub>x</sub>O<sub>2</sub> powders prepared via co-precipitation; first insights into an upscaling process

The present module involves the synthesis of Ce<sub>1-x</sub>Zr<sub>x</sub>O<sub>2</sub> mixed metal oxides as catalysts and their development as advanced catalytic materials. Simultaneous (co)precipitation is the method of choice for preparation of zirconia-ceria solid solutions. The precipitation agent (e.g. NaOH, Na<sub>2</sub>CO<sub>3</sub>) and metal nitrates (e.g. Ce(NO<sub>3</sub>)<sub>3</sub>\*6H<sub>2</sub>O) are added simultaneously to the solution and the parameters are carefully controlled. Temperature, pH, stirring rate, precursors, thermal treatment and the rate of addition of one solution into the other are key features in the final material morphology, structure and performance. The up-scaled catalyst synthesis using the coprecipitation method is performed in a 2 L- and 20 L- reactor.

