In Situ Investigation of Bulk ZnPd: Different Synthesis – New Results

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ZnPd in combination with ZnO has been shown to be a promising catalyst for methanol steam reforming (MSR).[1,2]The teamwork between ZnPd and the ZnO is an important component to attain the observed high activity and selectivity.[2]Due to the importance if this teamwork – and the dynamic nature of the system under MSR conditions – *in situ* investigations becomes vital. *In situ* XPS investigations of unsupported ZnPd has been carried out by M. Friedrich et al. showing the compositional dependence of ZnO formation *in situ*.[3]These studies where fruitful but hampered by the large amount of grain boundaries present in the samples.

During the C-MAC Days 2012 in Cracow, an idea for an innovative attempt to synthesize single-crystalline ZnPd was born by a deep discussion of one of the authors with Prof. Peter Gille. Direct consequences of this discussion will be briefly presented. Since then, the innovative synthesis route has been explored resulting in samples with increased grain size and consequently lower concentration of grain boundaries. These new samples have been investigated *in situ* giving a clearer picture of the dynamic behaviour of unsupported ZnPd in MSR.

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[2] M. Friedrich, S. Penner, M, Heggen, M. Armbrüster. Angew. Chem. Int. Ed. 2013, 52, 4389

[3] M. Friedrich, D. Teschner, A. Knop-Gericke, M. Armbrüster. J. Catal.2012, 285, 41