

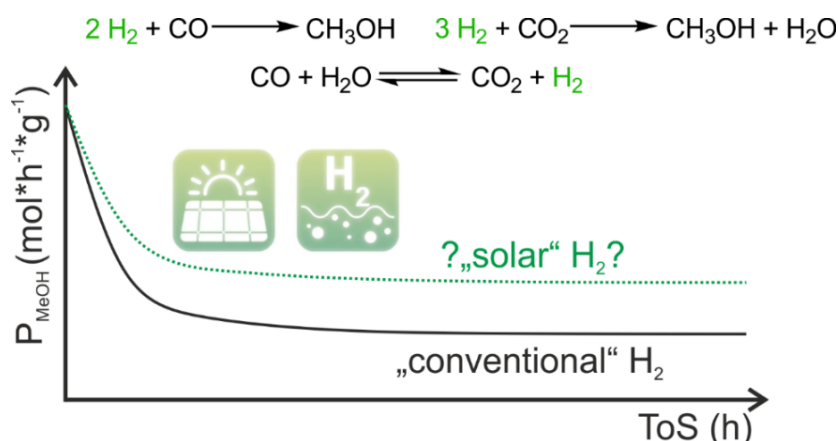
## Influence of impurities in H<sub>2</sub> from different sources on the deactivation of methanol synthesis catalyst

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Methanol synthesis is an important option for building up a fossil free chemical feedstock or for further transformation to synthetic fuels, if solar-based H<sub>2</sub> or H<sub>2</sub>/CO/CO<sub>2</sub> is used.<sup>[1]</sup> The deactivation of methanol synthesis catalysts depends on several factors.<sup>[2]</sup> As part of the InnoPool-Project “Solar Hydrogen - pure & compressed,” we use hydrogen from different sources for methanol synthesis and compare the impact of the impurities on the catalyst deactivation. For this, we conduct parallel catalyst material testing with long time-on-stream to initiate catalyst deactivation, withdraw the materials under an inert atmosphere and investigate them considering sintering and other adverse effects.



**Figure.** Possible influence on deactivation (seen in decrease of productivity curves) of solar based H<sub>2</sub> in comparison to “conventional” H<sub>2</sub>, caused by the different composition of impurities within.

### References:

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- [2] a) H. Kung, *Catal. Today* **1992**, 11, 443; b) J. Sun, I. Metcalfe, M. Sahibzada, *Ind. Eng. Chem. Res.* **1999**, 38, 3868; c) M. Twigg, *Top. Catal.* **2003**, 22, 191.

