

## Supporting Information

### **Boosting the Activity of Hydrogen Release from Liquid Organic Hydrogen Carrier Systems by Sulfur-Additives to Pt on Alumina Catalysts**

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### **TEM analysis of applied Pt on alumina catalysts**

Catalyst A

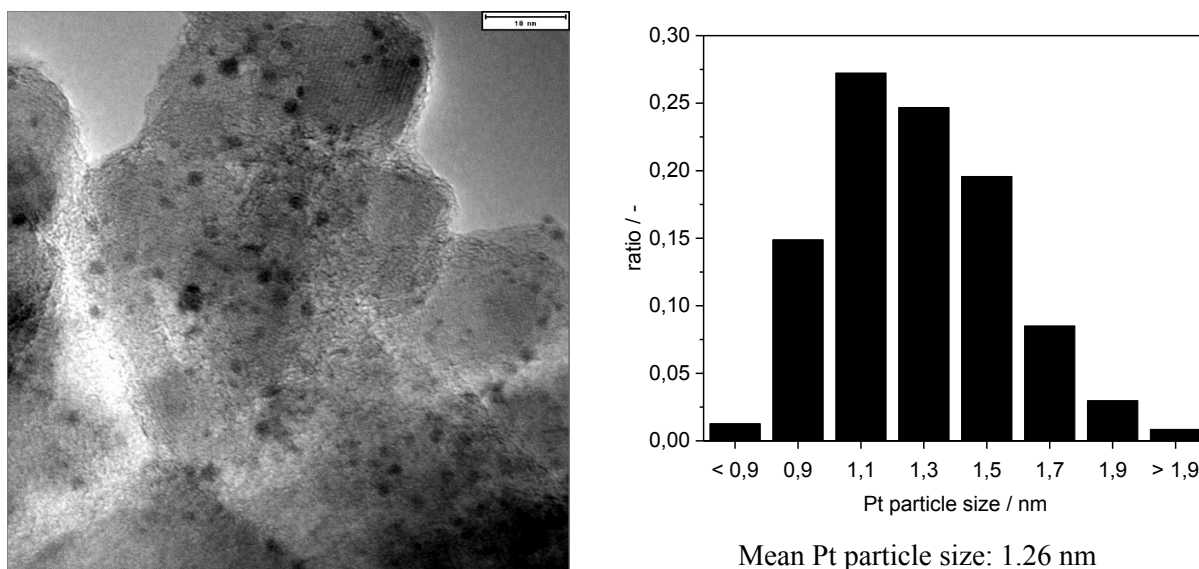
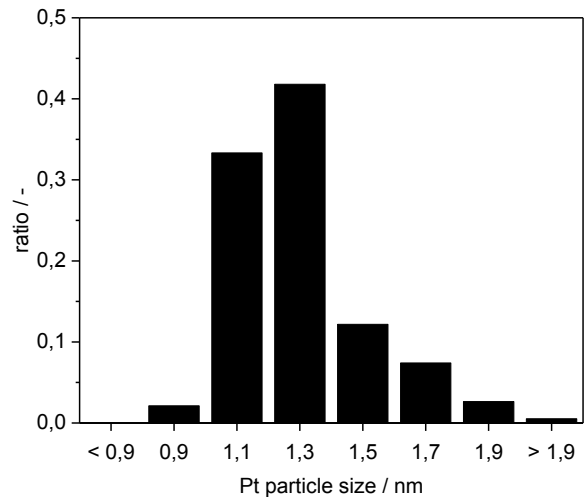
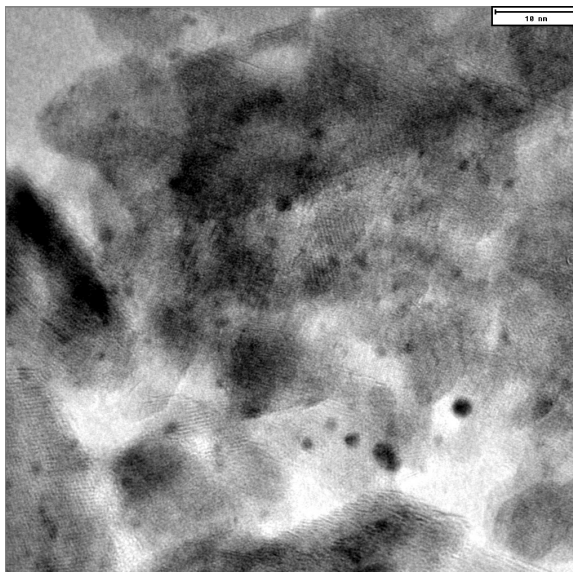


Figure 1: Exemplary TEM image and Pt particle size distribution of catalyst A; scale bar is 10 nm

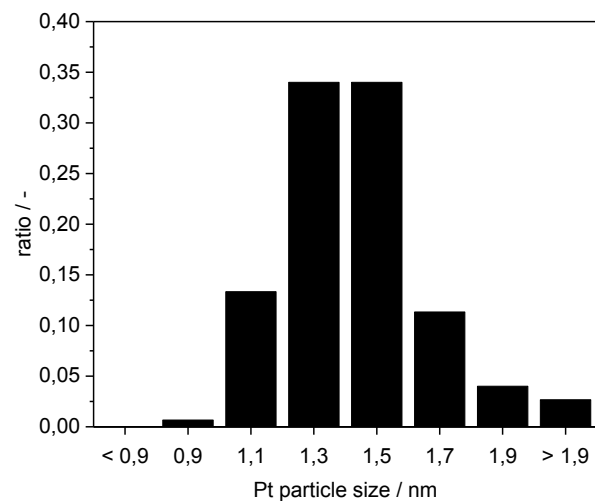
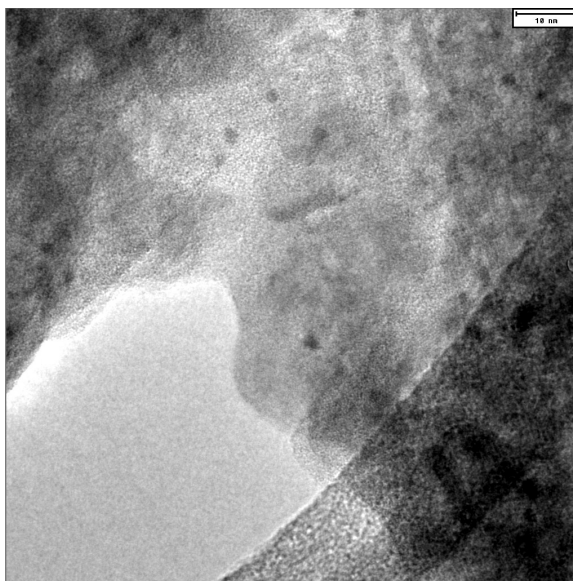
## Catalyst B



Mean Pt particle size: 1.31 nm

Figure 2: Exemplary TEM image and Pt particle size distribution of catalyst B; scale bar is 10 nm

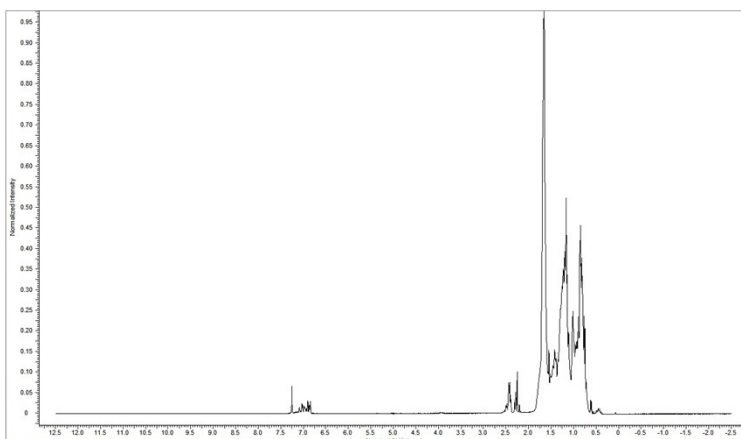
## Catalyst C



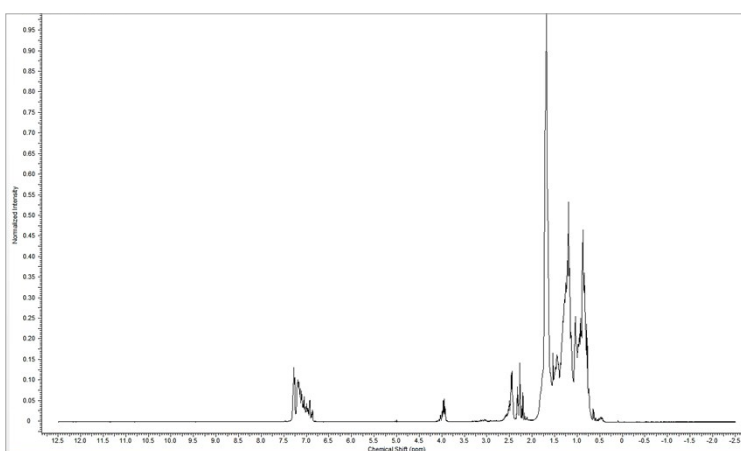
Mean Pt particle size: 1.44 nm

Figure 3: Exemplary TEM image and Pt particle size distribution of catalyst C; scale bar is 10 nm

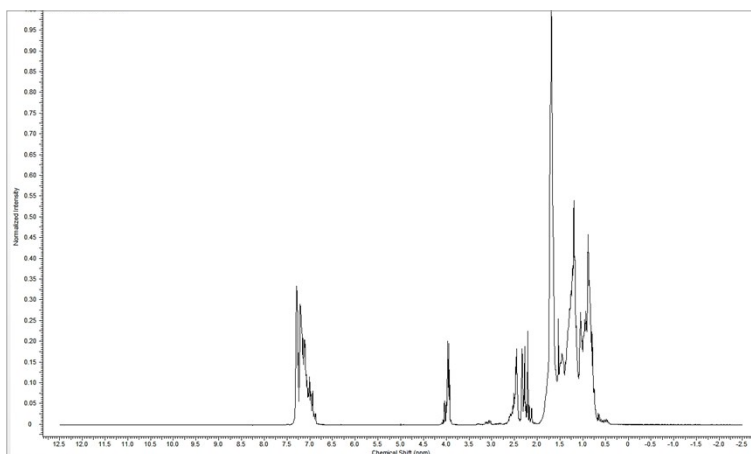
# <sup>1</sup>H-NMR of the reaction evolution



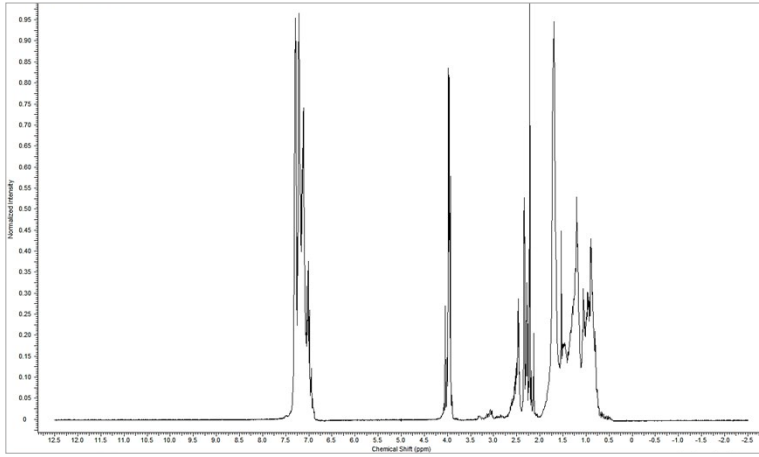
Reaction start (0 min)



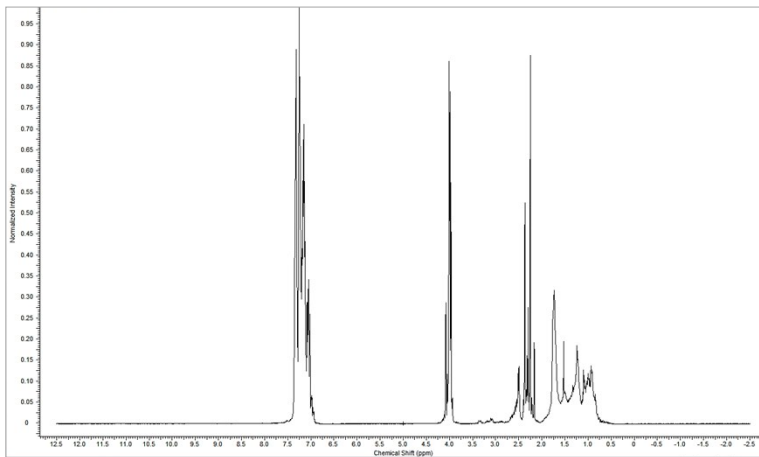
5 min



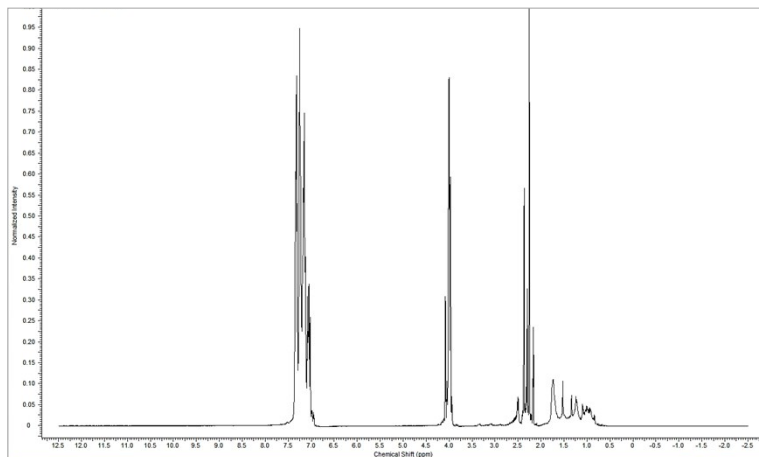
10 min



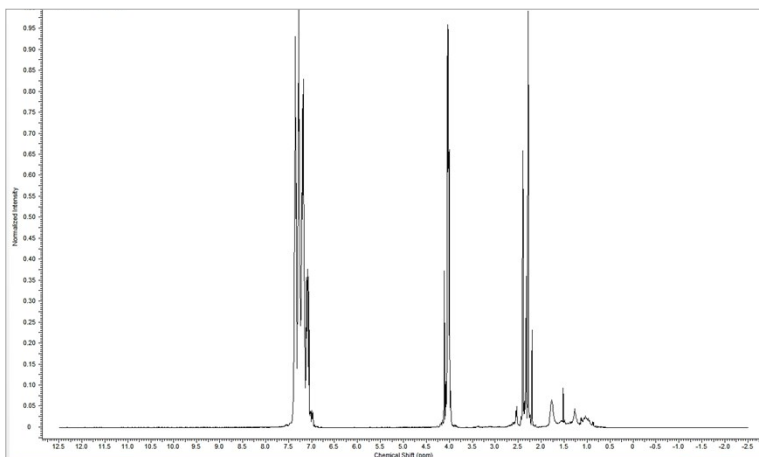
20 min



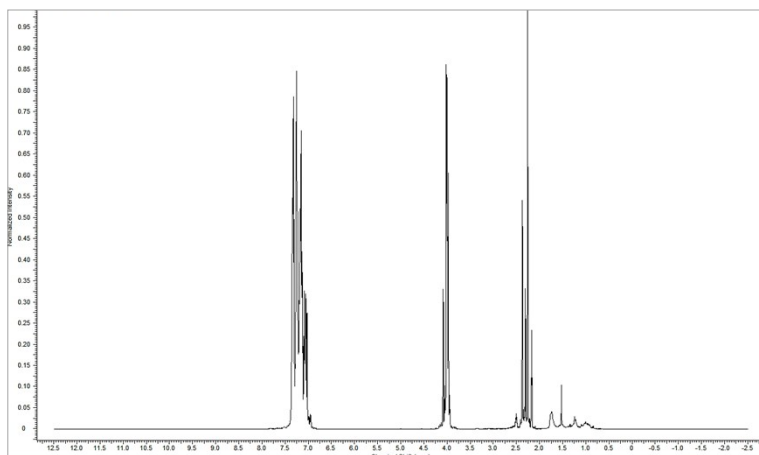
35 min



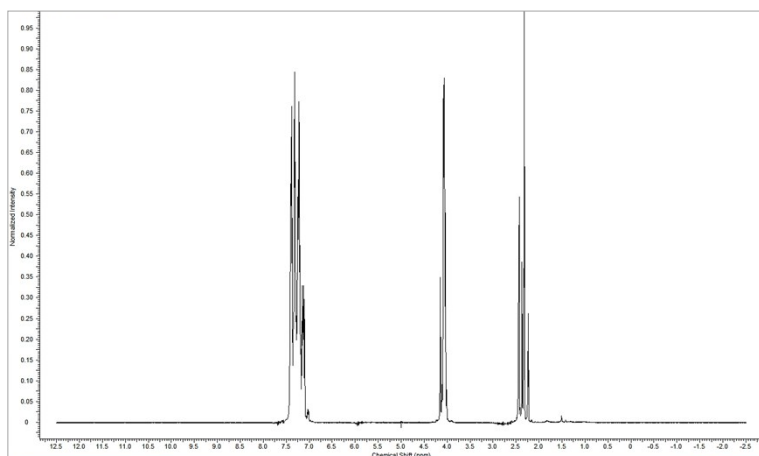
60 min



90 min



120 min



H0-DBT

Figure 4:  $^1\text{H-NMR}$  spectra of the reaction evolution with catalyst A; experimental conditions: 583 K, 0.1 MPa, 2 h, Argon atmosphere, 0.1 mol H18-DBT, 0.1 mol% n(Pt)/n(LOHC), Pt applied as 0.3 wt% Pt on alumina, 0.25 wt% S;  $^1\text{H-NMR}$  spectrum of H0-DBT as reference.