

Supported Rh-Phosphine Complex Catalysts for Continuous Gas-Phase Decarbonylation of Aldehydes

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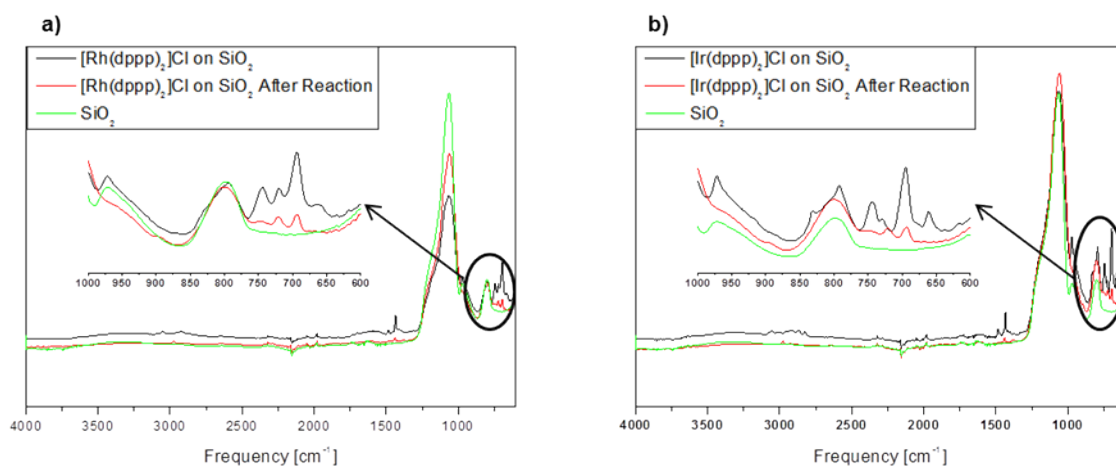
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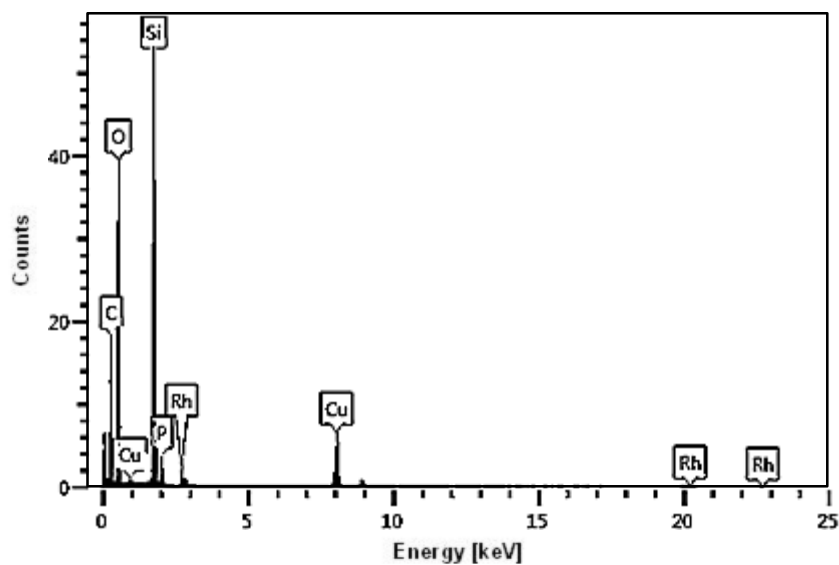
Supporting Information

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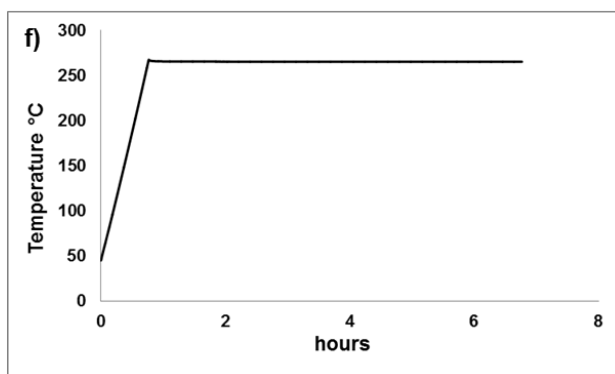
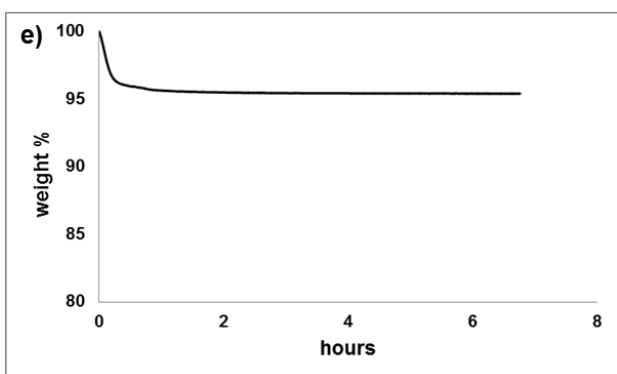
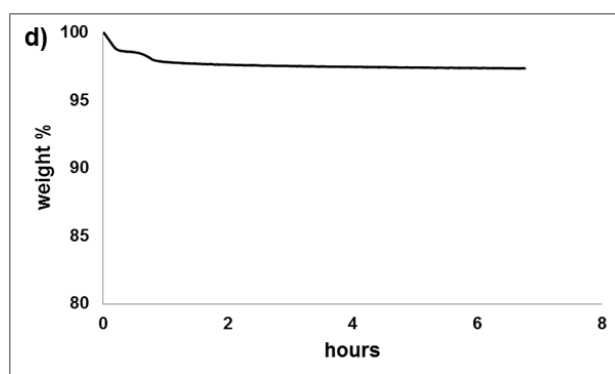
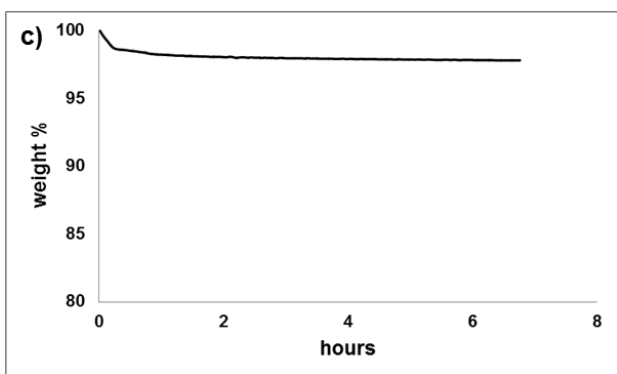
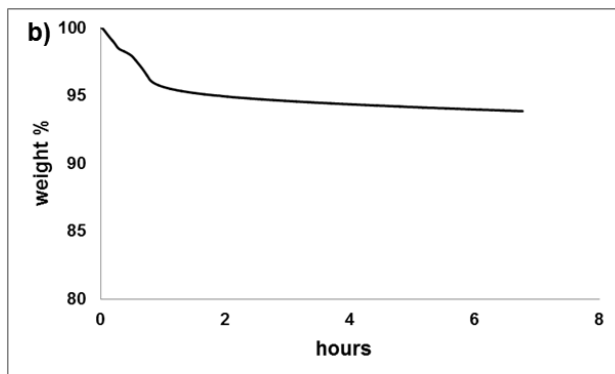
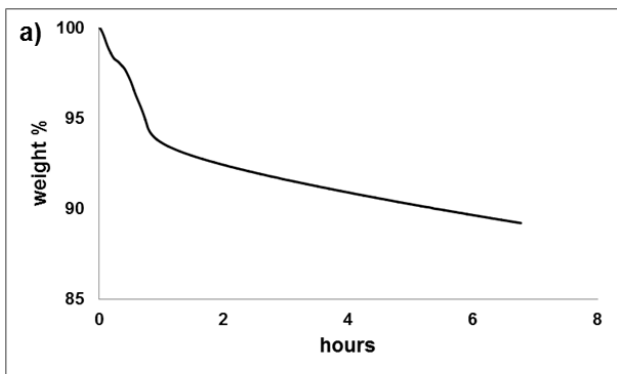
S1. FTIR spectra of a) Rh and b) Ir catalysts compared to the silica support material before and after reaction.



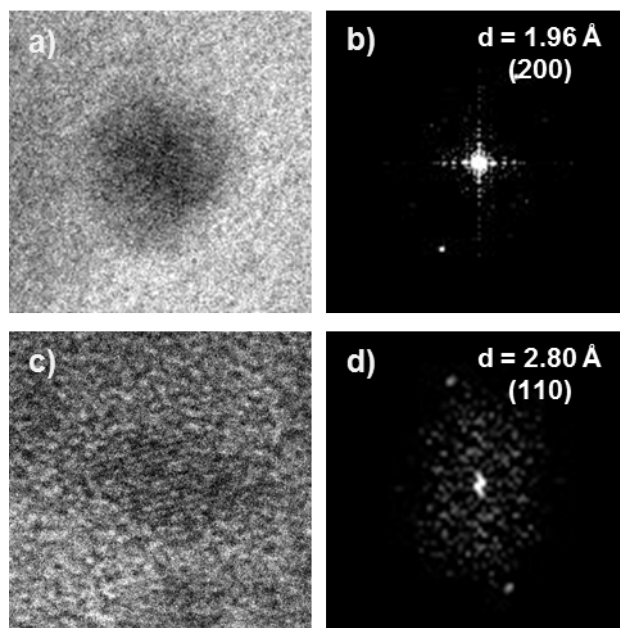
S2. EDX spectrum of $[\text{Rh}(\text{dppp})_2]\text{Cl}/\text{SiO}_2$ (3 wt.% Rh) catalyst after decarbonylation showing signals from rhodium, phosphorous, silicium, oxygen and carbon.

EDX	Before reaction	After reaction
	2.0	2.6
	2.1	2.2
<i>Rh loading mol%</i>	2.4	1.9
	1.7	1.8
	1.7	2.6
	2.1	2.0
Average mol%	2.0 ± 0.3	2.2 ± 0.3
	3.0	2.0
	3.0	2.5
<i>P-to-Rh ratio</i>	3.3	2.8
	3.6	2.8
	3.6	2.9
	3.7	3.3
Average ratio	3.4 ± 0.3	2.7 ± 0.4

S3. EDX measurements of metal loading and phosphor content before and after decarbonylation reaction (average mol% and ratios based on six measurements).



S4. TGA profiles for a) $[\text{Rh}(\text{dppp})_2]\text{Cl}$, b) $[\text{Rh}(\text{dppp})_2]\text{Cl}/\text{SiO}_2$, c) $[\text{Rh}(\text{COD})\text{Cl}]_2/\text{SiO}_2$, d) $\text{RhCl}_3 \cdot x\text{H}_2\text{O}/\text{SiO}_2$, e) silica-90 and f) temperature profile for the TGA measurements (heating rate of 5 °C/min from room temperature to 260 °C followed by constant temperature for 6 h).



S5. TEM micrographs and corresponding fast Fourier transforms (FFTs) showing atomic resolution of the nanoparticles formed during the decarbonylation reaction with $[\text{Rh}(\text{dppp})_2]\text{Cl}/\text{SiO}_2$ under the described experimental conditions.