Supporting Information

Highly Active, Durable and Recyclable Ordered Mesoporous Magnetic Organometal Catalysts Promoted Organic Reactions in Water

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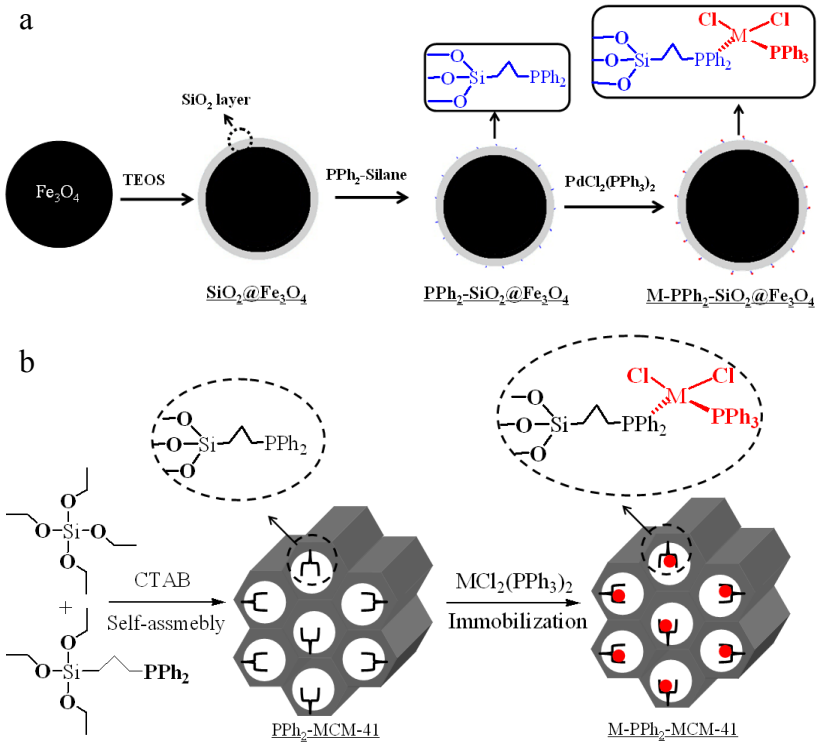
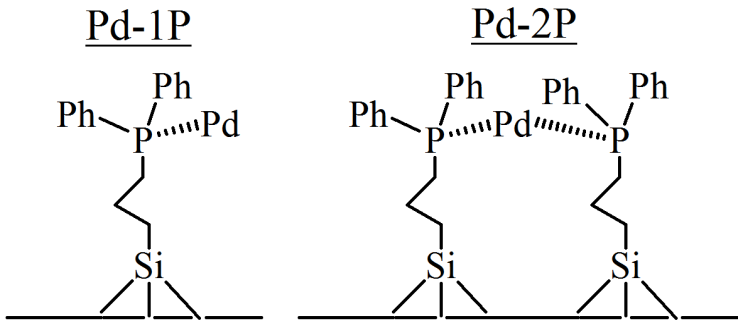


Scheme S1 Schematic illustration of the synthetic procedure of (a) M-PPh_2-SiO_2@Fe_3O_4 and (b) M-PPh_2-MCM-41 catalysts (M = Pd^{2+} or Rh^{+}).



Scheme S2 Dependence of the coordination model on the P/M ratio of different catalysts.

Table S1 Elemental analysis and structural parameters of different catalysts

Sample	Pd Loading (mmmol/g)	P content (mmmol/g)	Particle Size (nm)	S_{BET} (m^2/g)	D_P (nm)	V_P (cm^3/g)
Pd-PPh_2-SiO_2@Fe_3O_4	0.0109	0.110	440	35	1.0	0.030
PPh_2-MCM-41@SiO_2@Fe_3O_4	/	0.380	/	268	2.9	0.43
Pd-PPh_2-MCM-41@SiO_2@Fe_3O_4	0.0723	0.503	520	240	2.8	0.37
Pd-PPh_2-MCM-41	0.161	0.516	10~1500	551	2.5	0.60
Pd-PPh_2-MCM-41@SiO_2@Fe_3O_4[a]	0.0683	0.290	530	170	2.8	0.21
Pd-PPh_2-SiO_2@Fe_3O_4[a]	0.00896	0.195	445	31	1.0	0.030
Pd-PPh_2-MCM-41[a]	0.150	0.560	10~1500	510	2.5	0.57
Rh-PPh_2-MCM-41@SiO_2@Fe_3O_4	0.0765	0.496	530	170	2.8	0.21
Rh-PPh_2-SiO_2@Fe_3O_4	0.0120	0.108	445	31	1.0	0.030
Rh-PPh_2-MCM-41	0.167	0.510	10~1500	510	2.5	0.57

[a] The catalysts after being reused for 8 times.

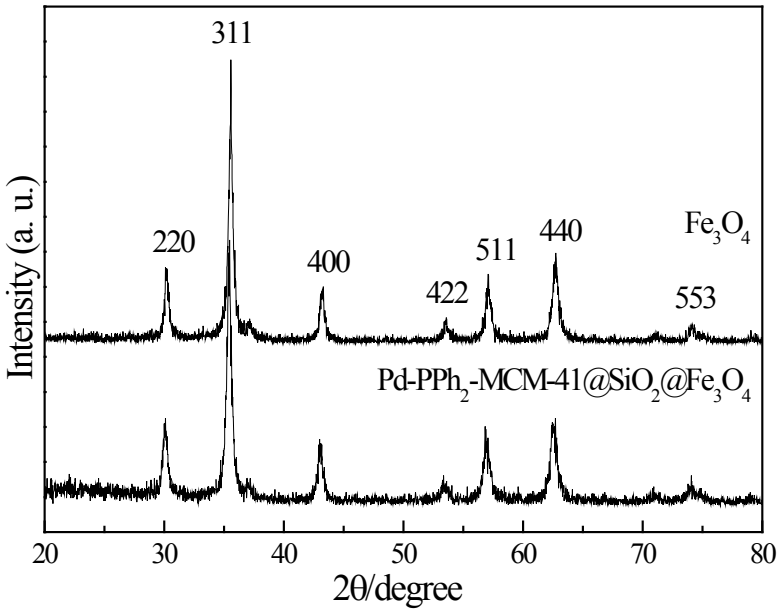


Figure S1 Wide-angle XRD patterns of Fe_3O_4 and Pd-PPh_2-MCM-41@SiO_2@Fe_3O_4.

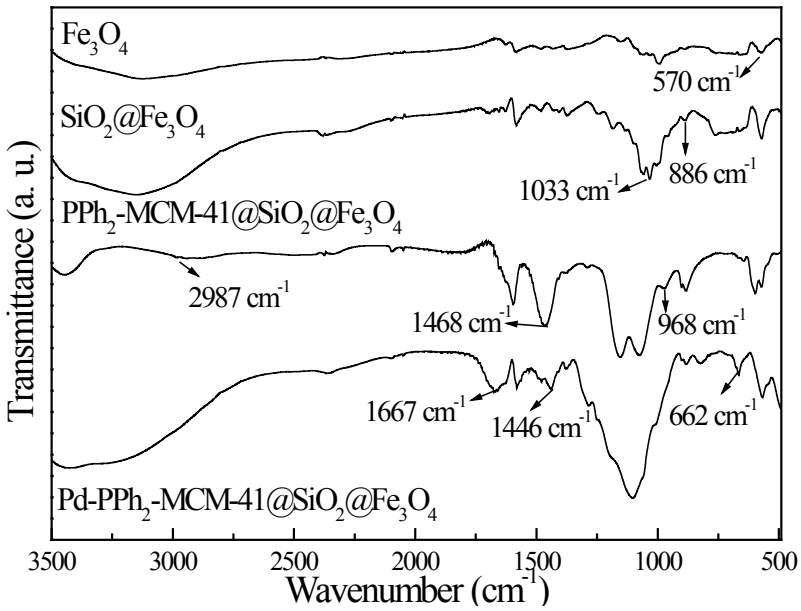


Figure S2 FT-IR spectra of Fe_3O_4, $SiO_2@Fe_3O_4$, PPh_2-MCM-41@$SiO_2@Fe_3O_4$, and Pd-PPh_2-MCM-41@$SiO_2@Fe_3O_4$ samples.

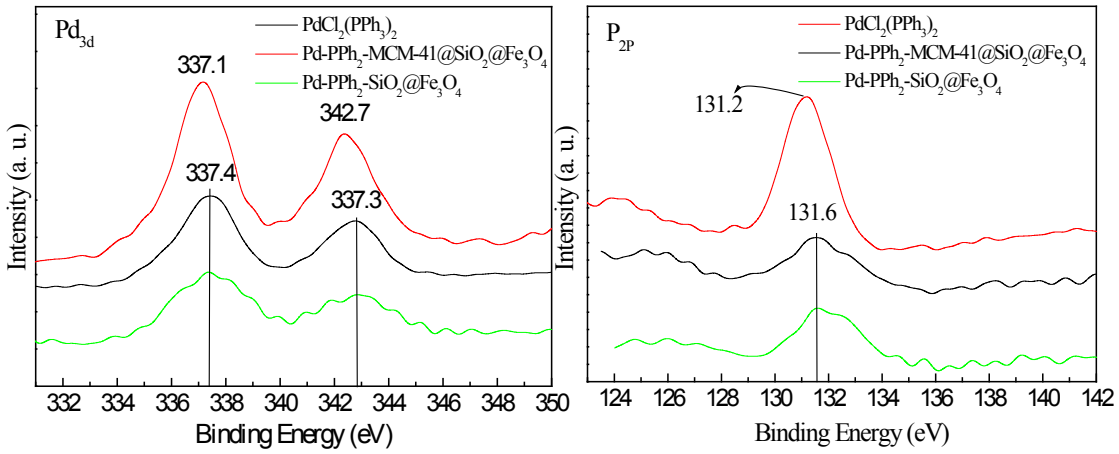


Figure S3 XPS spectra of Pd-PPh_2-MCM-41@SiO_2@Fe_3O_4, Pd-PPh_2-SiO_2@Fe_3O_4, and $PdCl_2(PPh_3)_2$.

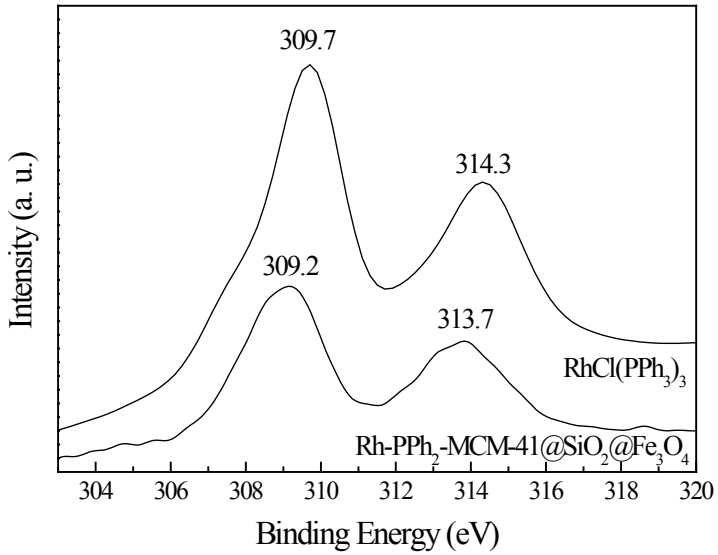


Figure S4 XPS spectra of $RhCl(PPh_3)_3$ and Rh-PPh_2-MCM-41@SiO_2@Fe_3O_4 catalysts.

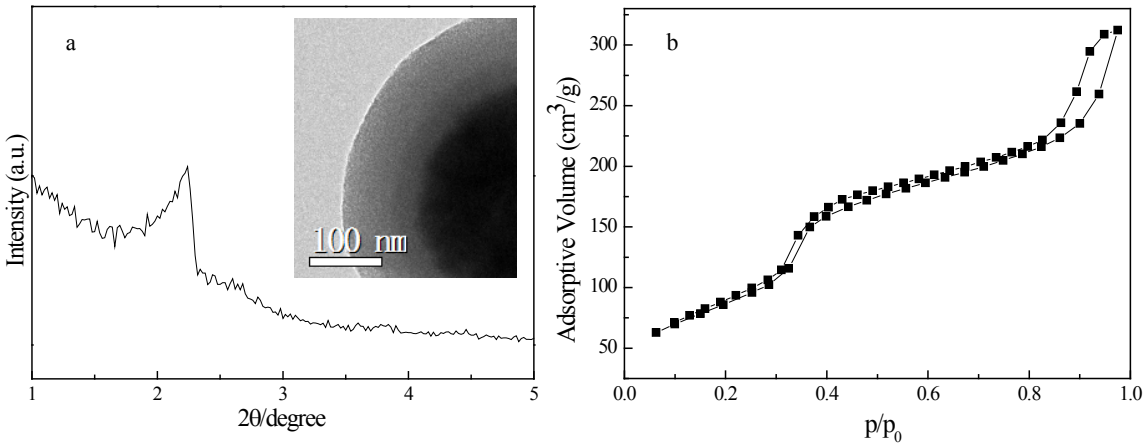


Figure S5 (a) Low-angle XRD pattern and (b) N_2 sorption isotherm of the Rh-PPh_2-MCM-41@SiO_2@Fe_3O_4. The attached is the HRTEM image.

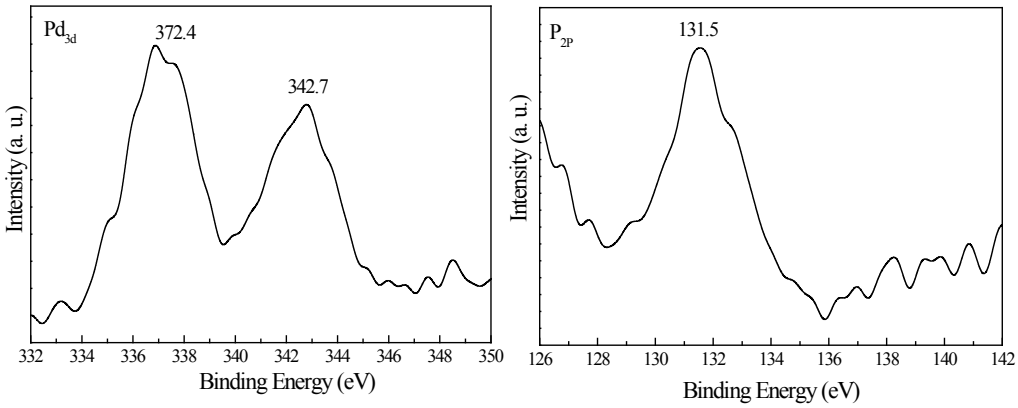


Figure S6 XPS spectra of the Pd-PPh_2-MCM-41@SiO_2@Fe_3O_4 catalyst after being reused repetitively for 8 times.

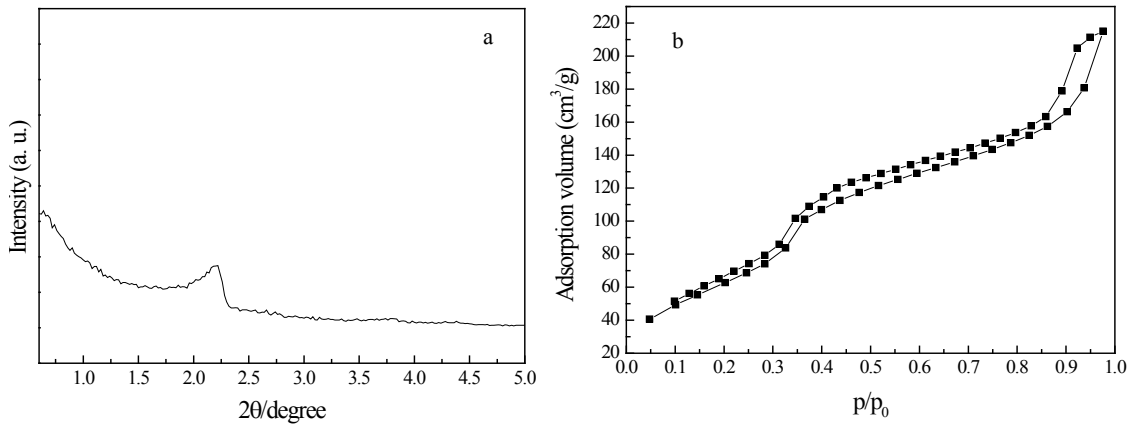


Figure S7 Low-angle XRD pattern (a) and N_2 adsorption-desorption curve (b) of the Pd-PPh_2-MCM-41@SiO_2@Fe_3O_4 catalyst after being reused repetitively for 8 times.