Electronic Supplementary Information (ESI)

Magnetic Iron Oxide Microspheres Coated by Hierarchical Structural Silica: Highly Stable Composite System and Ideal Catalyst Supports

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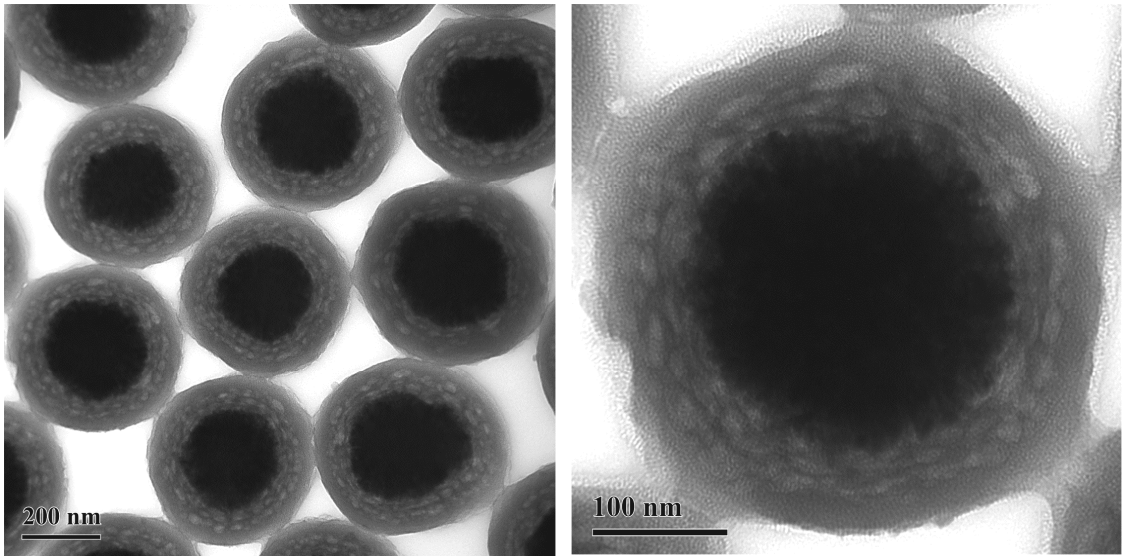

Figure S1 TEM images of MIO@H-SiO_2, whose synthesis adopt 24 h of pseudomorphic transformation.

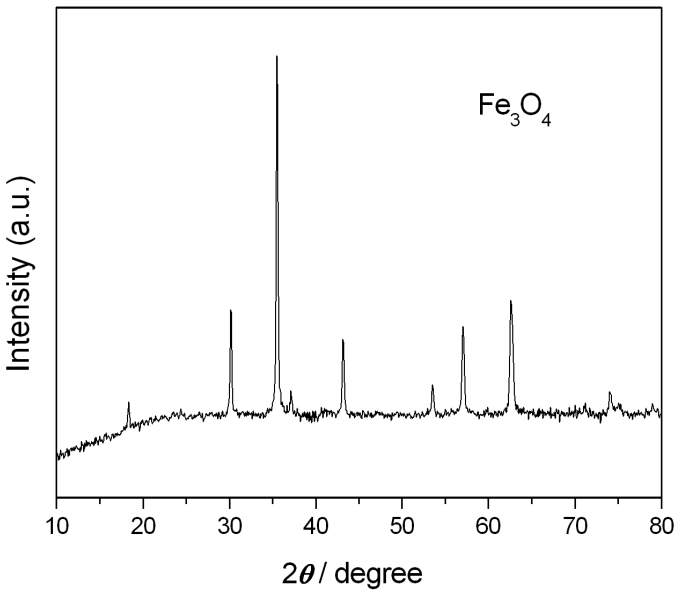

Figure S2 XRD pattern of MIO cores.

Table S1 Mössbauer hyperfine parameters of MIO core, MIO@nSiO_2/H-SiO_2 and Pt / MIO@nSiO_2/H-SiO_2

Sample	IS (mm/s)	QS (mm/s)	2Γ (mm/s)	B (T)	A (%)	Component	Phase
MIO core	0.63	0.02	0.50	45	43	$Fe^{2.5+}$	Fe_3O_4
	0.31	-0.02	0.43	49	57	Fe^{3+}	
MIO@nSiO_2/H-SiO_2	0.21	0	0.57	48	68	Fe^{3+}	γ-Fe_2O_3
	0.19	-0.03	0.96	44	32	Fe^{3+}	
Pt / MIO@nSiO_2/H-SiO_2	0.61	-0.01	0.58	45	55	$Fe^{2.5+}$	Fe_3O_4 /Fe
	0.30	0	0.38	48	37	Fe^{3+}	
	0	0	0.58	33	8	Fe^{0}	

IS--isomer shift relative to α-Fe; QS--quadrupole splitting; 2Γ--line width; B--magnetic field; A--relative subspectral area

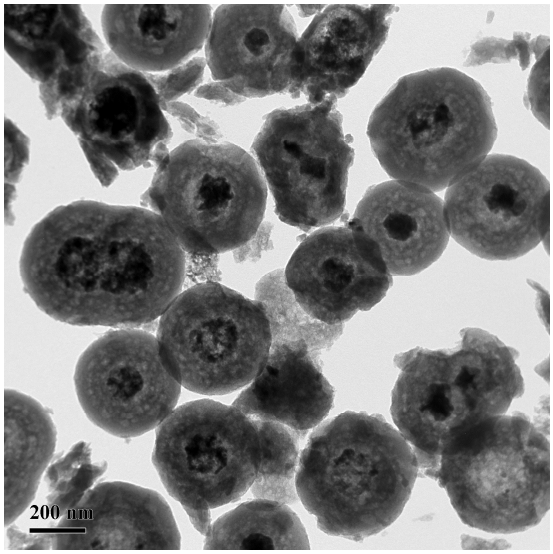

Figure S3 TEM image of MIO@H-SiO_2 immerged in 1 M HCl for 24 h

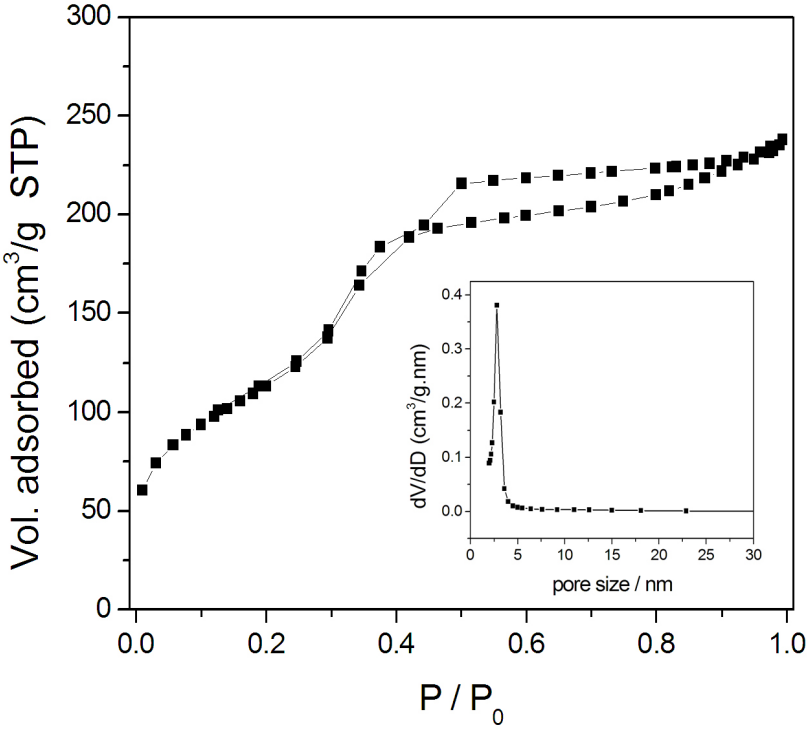

Figure S4 N_2 physical adsorption-desorption isotherm and pore size distribution (inset) of HCl treated MIO@nSiO_2/H-SiO_2

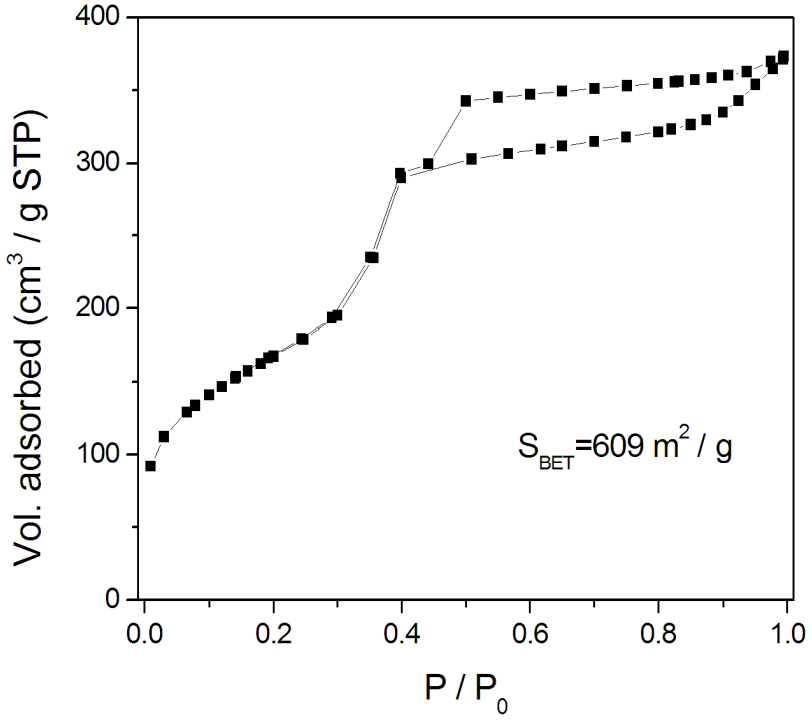

Figure S5 N_2 physical adsorption-desorption isotherm of MIO@H-SiO_2

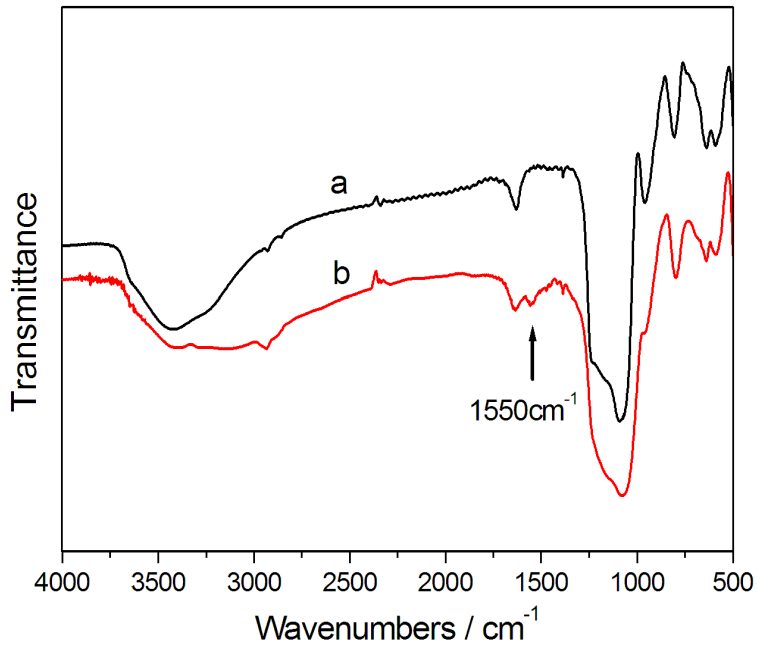

Figure S6 FT-IR spectra of (a) MIO@nSiO_2/H-SiO_2 and (b) APTS-MIO@nSiO_2/H-SiO_2. The band at 1550cm^{-1} is assigned to the N-H bend vibration, which indicates the existence of –NH_2 group in APTS modified sample.

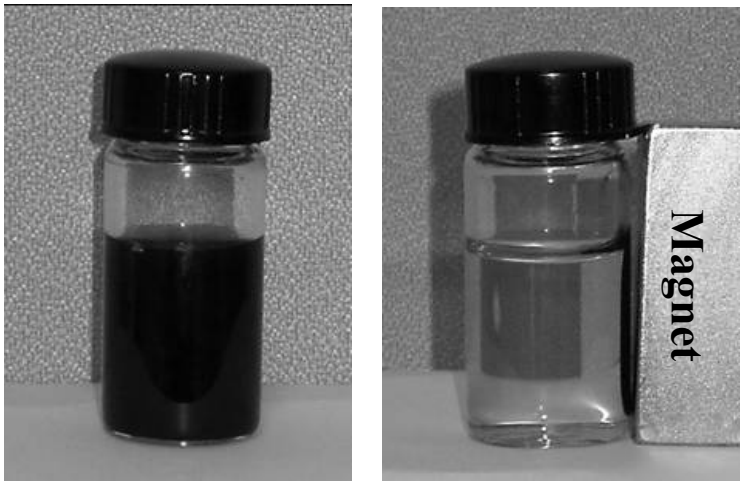

Figure S7 The photos described the convenient separation of the catalysts by using external magnet.