Supporting Information

for

Arsenic adsorption by iron oxide nanoparticles confined in mesoporous silicates: effect of the host pore structure

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Table S1. Adsorption isotherm fitting parameters of As(V) by Fe@MPS

Adsorbent	R^2	
	Langmuir model	Freundlich model
Fe@MCM-41	0.996	0.959
Fe@SBA-15	0.994	0.944
Fe@MSU-F	0.976	0.927

Table S2. Comparison of adsorption capacity with various iron oxide adsorbents

Adsorbent	Capacity (mg/g)	Reaction conditions	Ref
Fe_3O_4 nanoparticle	3.7	pH 2, initial [As(V)] =1.5 mg/L	S1
Fe_3O_4, Fe_3O_4-CTAB	23 for Fe_3O_4-CTAB; 7.6 for Fe_3O_4	pH 6.0, initial [As(V)]=7 mg/L	S2
Iron oxide@$CaCO_3$	270.27	pH 6.8, initial [As(V)]=30 mg/L	S3
Ferrihydrite	17.4 mg/g-Fe	pH 7.0 ± 0.5,	S4
Schwertmannite	21.5 mg/g-Fe		
Goethite	6.04 mg/g-Fe		
Chitosan-goethite	11.0 mg/g at pH=5; 3.7 mg/g at pH=9.	Initial [As(V)]=50 mg/L	S5
Magnetite NPs (35 nm)	16.1 mg/g at 298K	pH 5.0, intial [As(V)]=60 mg/L	S6
Fe@MPS	24~74 mg/g-Fe at 298K	pH 4.0, initial [As(V)]=2 mg/L	This study

Table S3. Basic parameters of realistic local lake water used in this study

Parameters	pH	Turbidity (NTU)	TOC (mg/L)	Conductivity (μS/cm)	DO (mg/L)
Value	7.2±0.1	6.24±0.4	5.6±0.5	423±25	8.3±0.7

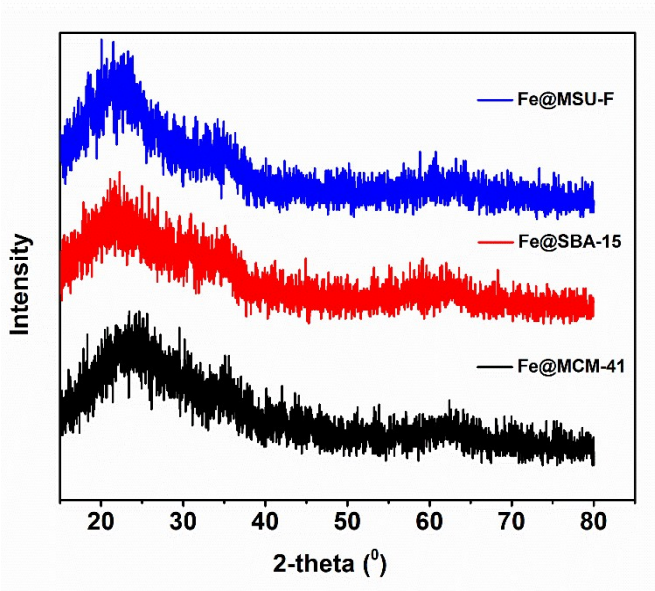

Figure S1. XRD patterns of Fe@MPS nanocomposites

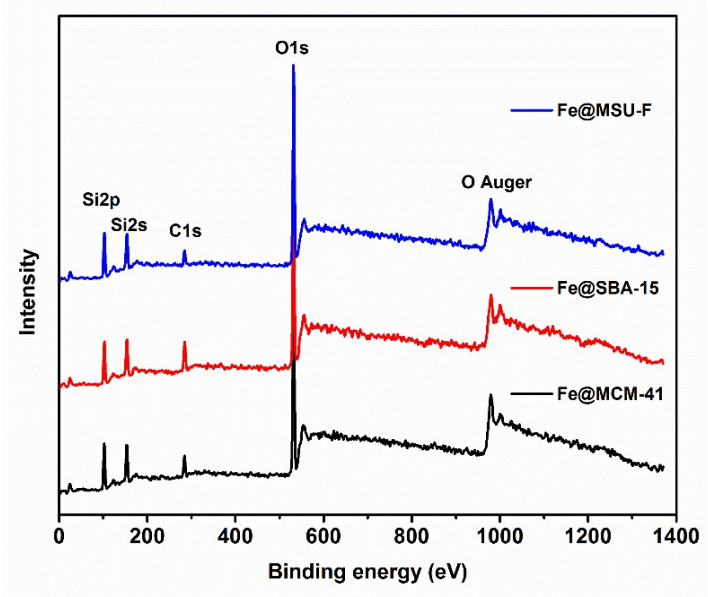

Figure S2. XPS spectra of three Fe@MPS nanocomposite adsorbents

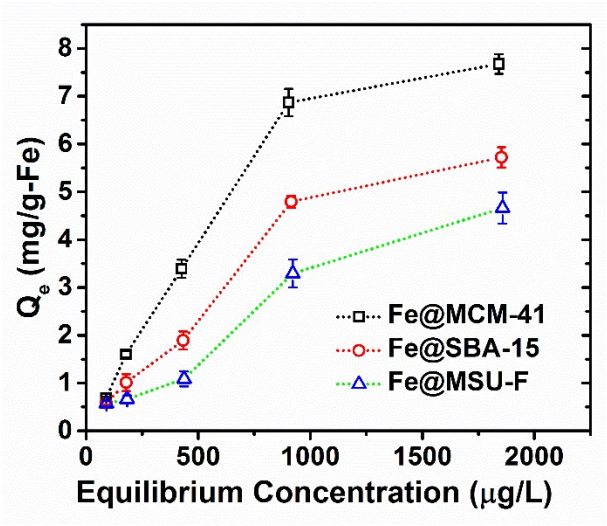

Figure S3. Adsorption isotherm of As(III) onto Fe@MPS (25 ^{o}C, dosage of adsorbents: 0.4 g/L, pH=6.5)

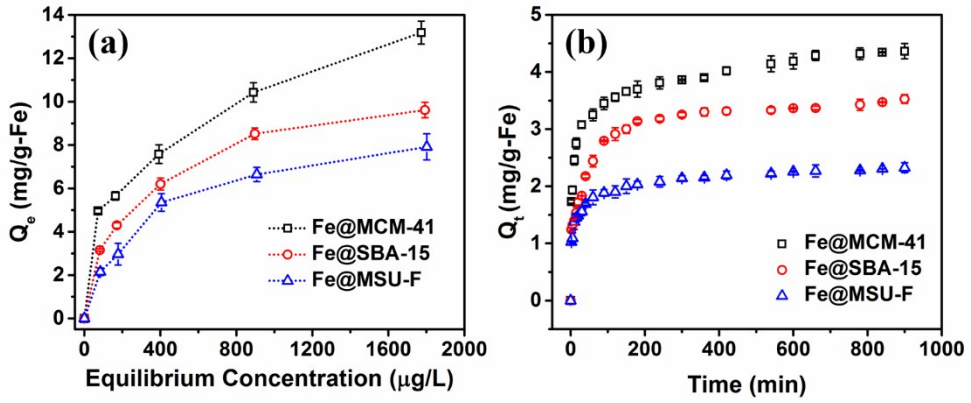

Figure S4. Adsorption of As(V) onto Fe@MPS at pH 6.5 (25 °C, dosage of adsorbents: 0.40 g/L). (a) Isotherm and (b) kinetic data (initial [As(V)]: 0.1 mg/L)

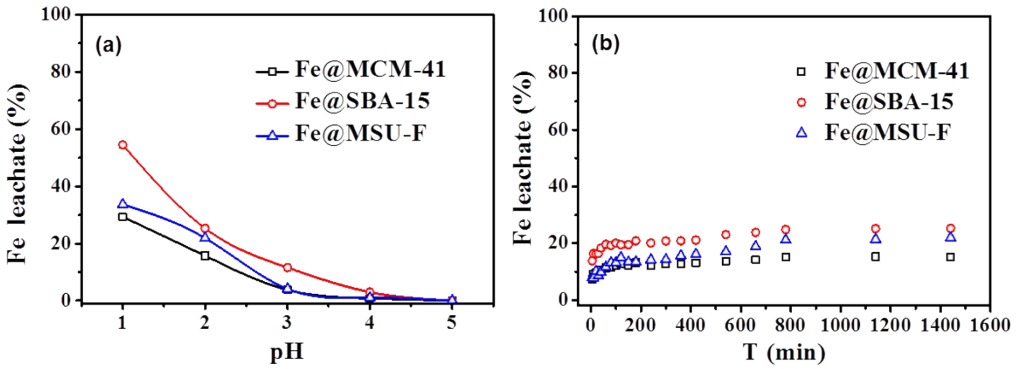

Figure S5. Effect of pH (a, 24 h) and contact time (b, pH=2) on iron leaching from Fe@MPS nanocomposites

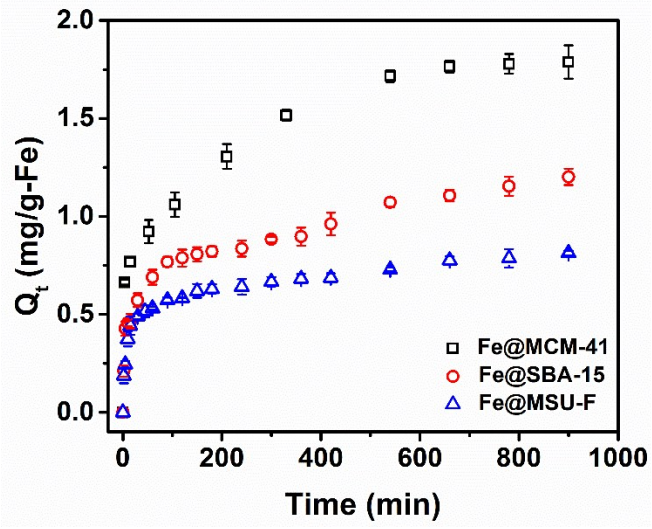

Figure S6. Adsorption kinetic of As(V) in realistic lake water by Fe@MPS (Lake water were sampled from Yangshan Lake, Nanjing, China, initial [As(V)]=100 μg/L, dosage of adsorbents: 0.40 g/L, 25 °C)

References

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