Supporting Information

Poly(ionic liquid)-Modified Magnetic Janus Particles for Dye Degradation

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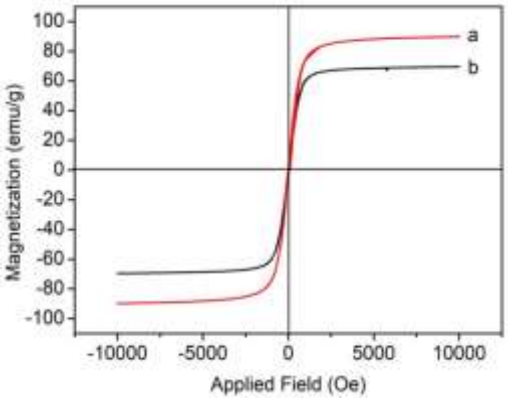

Figure S1. The magnetic hysteresis loops of representative magnetic particles: (a) Fe_3O_4 particles; (b) $Fe_3O_4@SiO_2$ particles.

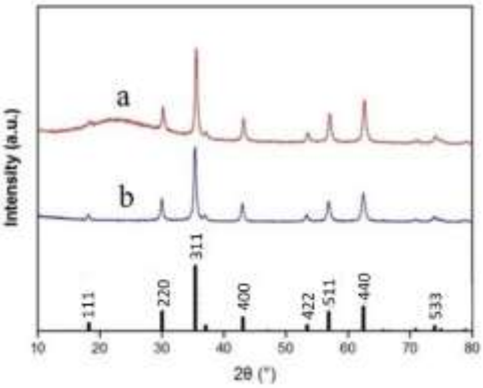

Figure S2. X-ray powder diffraction spectra of representative magnetic particles: (a) Fe_3O_4 particles; (b) $Fe_3O_4@SiO_2$ particles.

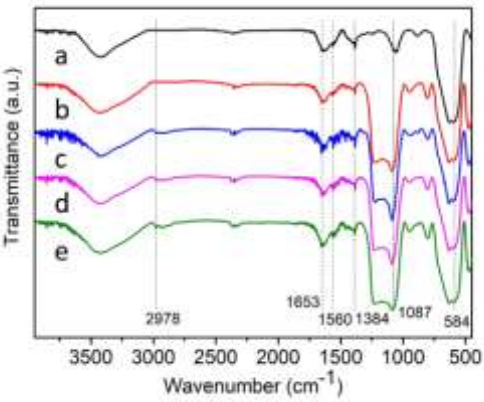

Figure S3. FT-IR spectra of representative magnetic particles: (a) Fe_3O_4 particles; (b) $Fe_3O_4@SiO_2$ particles; (c) amino modified $Fe_3O_4@SiO_2$ particles; (d) phenyl modified $Fe_3O_4@SiO_2$ particles; (e) initiator based

$Fe_3O_4@SiO_2$ Janus particles.

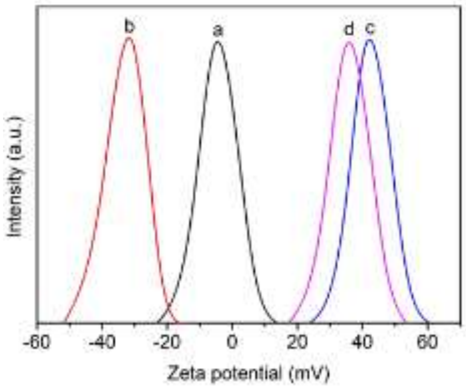

Figure S4. Zeta potential of representative magnetic particles (T = 300 K, pH = 7,0): (a) Fe_3O_4 particles; (b) $Fe_3O_4@SiO_2$ particles; (c) amino modified $Fe_3O_4@SiO_2$ particles; (d) phenyl modified $Fe_3O_4@SiO_2$ particles.

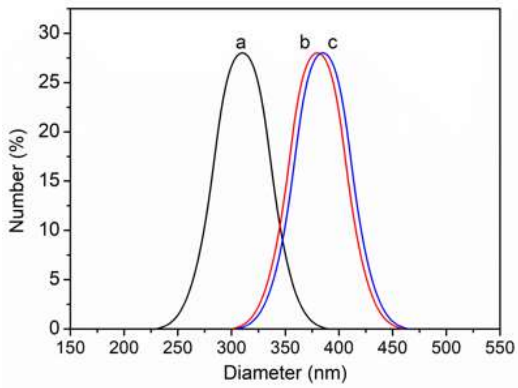

Figure S5. Particle size analysis of representative magnetic particles: (a) Fe_3O_4 particles; (b) $Fe_3O_4@SiO_2$ particles; (c) phenyl modified $Fe_3O_4@SiO_2$ particles.

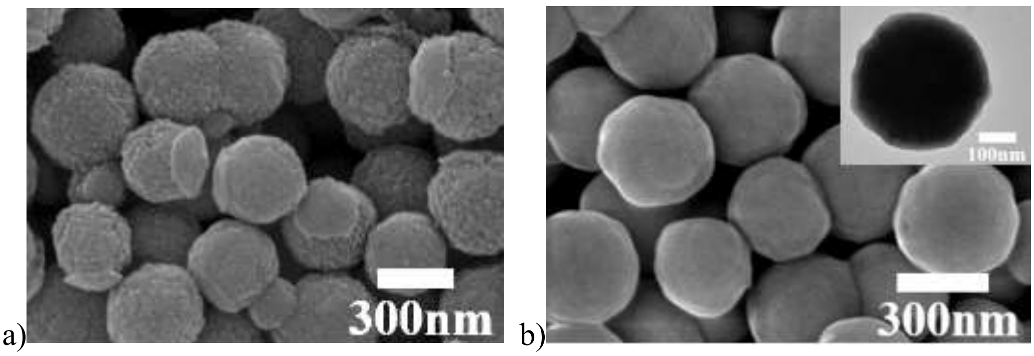

Figure S6. Representative Janus particles: (a) SEM image of phenyl modified $Fe_3O_4@SiO_2$ Janus particles after selective etching for 1 h. (b) SEM and inset TEM images of the $Fe_3O_4@SiO_2$ Janus particles with amino groups on one side and phenyl groups on the other side.

Table S1. Elemental analysis of the PILs modified Fe_3O_4@SiO_2 Janus particles by XPS measurement.

NO.	*Atomic (%)*						
	C	O	Si	N	Br	F	W
1	71.8	21.3	5.0	1.5	0.3	0	0
2	70.3	20.9	5.6	1.4	0	1.8	0
3	68.9	20.9	5.0	1.7	0	0	3.5

Table S2. The absorbance of different concentrations of methyl orange samples.

NO.	Cs (mg/L)	Absorbance
1	10	0.5407
2	20	1.3012
3	30	2.1931
4	40	2.7817
5	50	3.4815

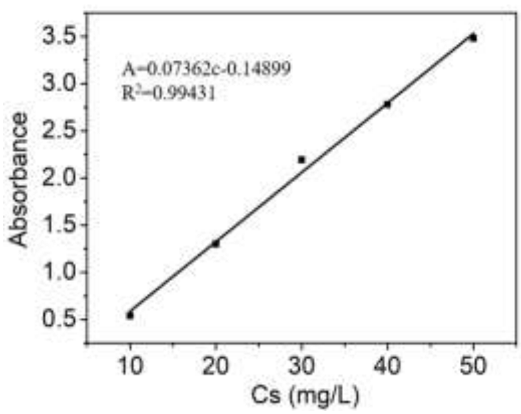

Figure S7. The standard working curve of methyl orange.

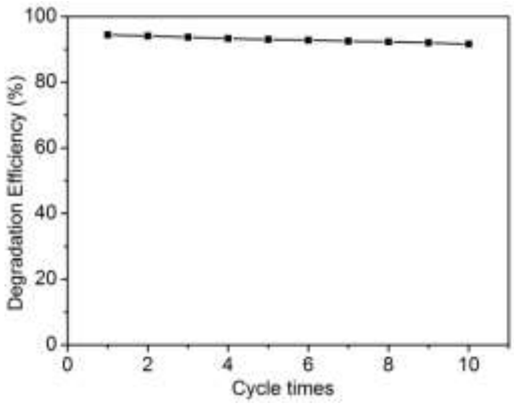

Figure S8. Catalyst recycling of the $PW_{12}O_{40}^{3-}$ based PILs modified Fe_3O_4@SiO_2 Janus particles as solid stabilizers.