Electronic Supporting Information (ESI) for

Hydrophilic, hollow Fe_3O_4@PDA spheres with storing cavity for efficient removal of polycyclic structured tetracycline

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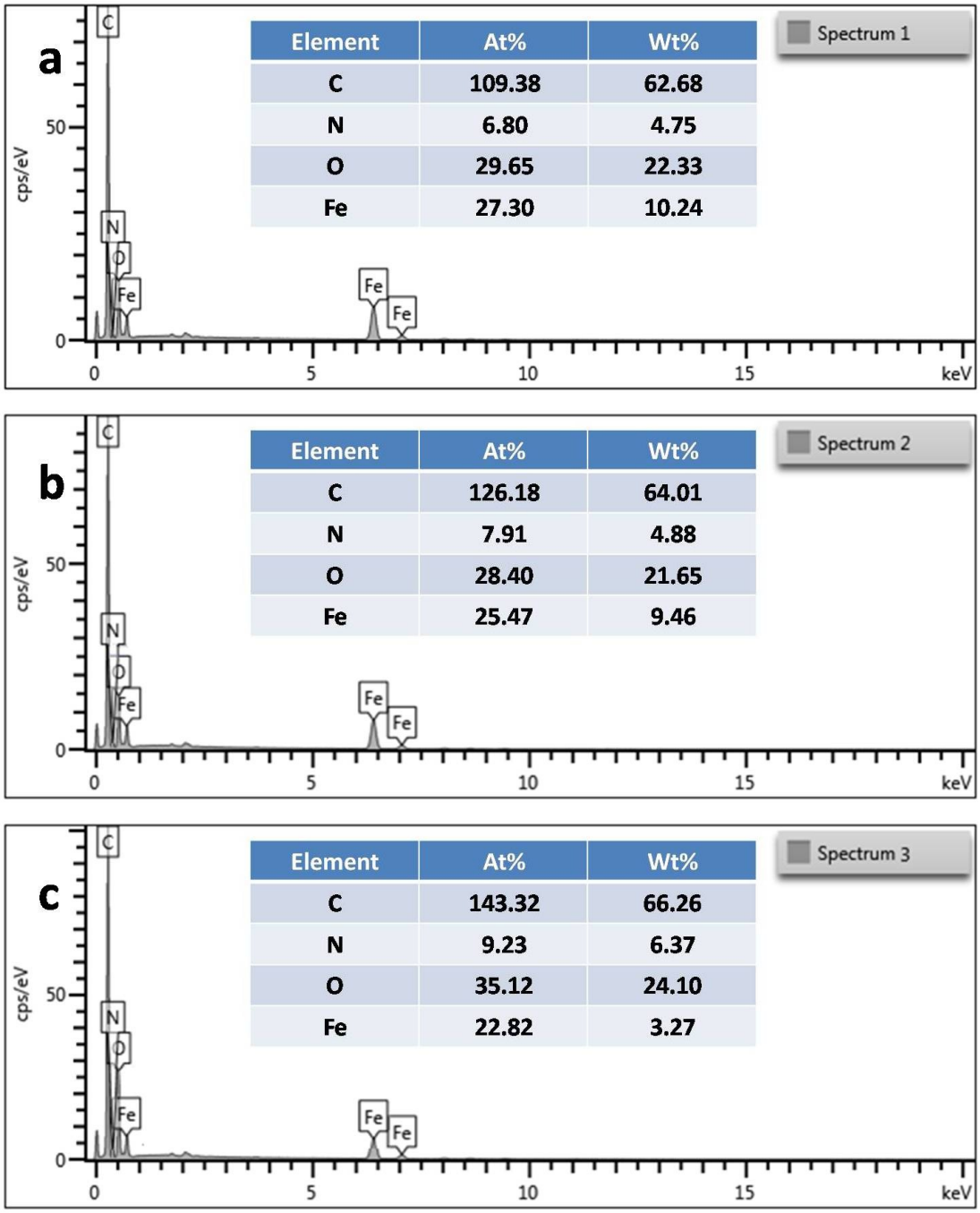

Fig. S1 EDS analysis of (a) Fe_3O_4@PDA (50) HSs; (b) Fe_3O_4@PDA (100) HSs; (c) Fe_3O_4@PDA (200) HSs.

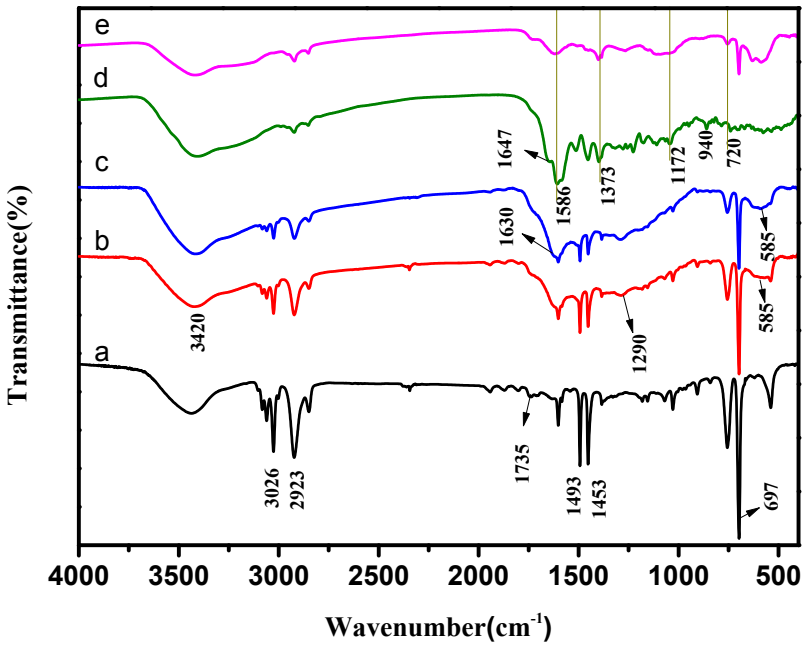

Fig. S2 FT-IR spectra of (a) PS-COOH nanospheres; (b) PS@Fe_3O_4@PDA composites; (c) Fe_3O_4@PDA HSs; (d) pure TC; (e) TC loaded Fe_3O_4@PDA HSs.

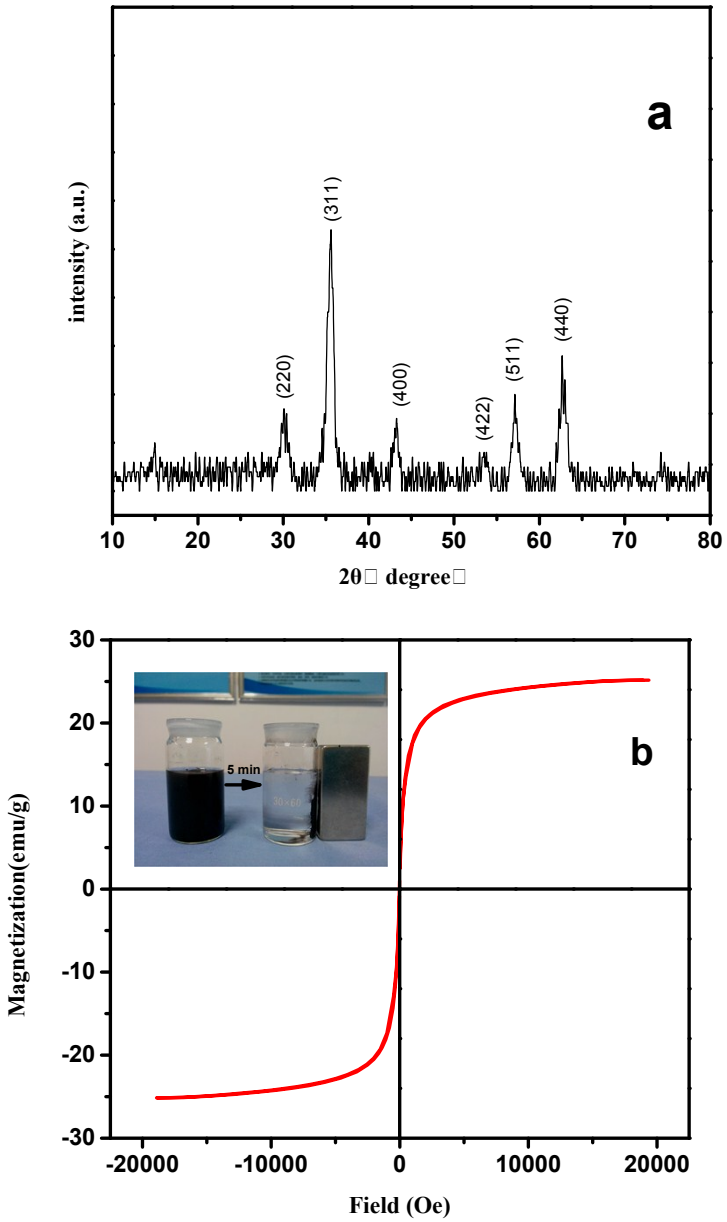

Fig. S3 (a) XRD pattern of Fe_3O_4@PDA HSs; (b) Room temperature magnetization curve of Fe_3O_4@PDA HSs, The inset photographs: separation of Fe_3O_4@PDA HSs from aqueous dispersion using an external magnet.

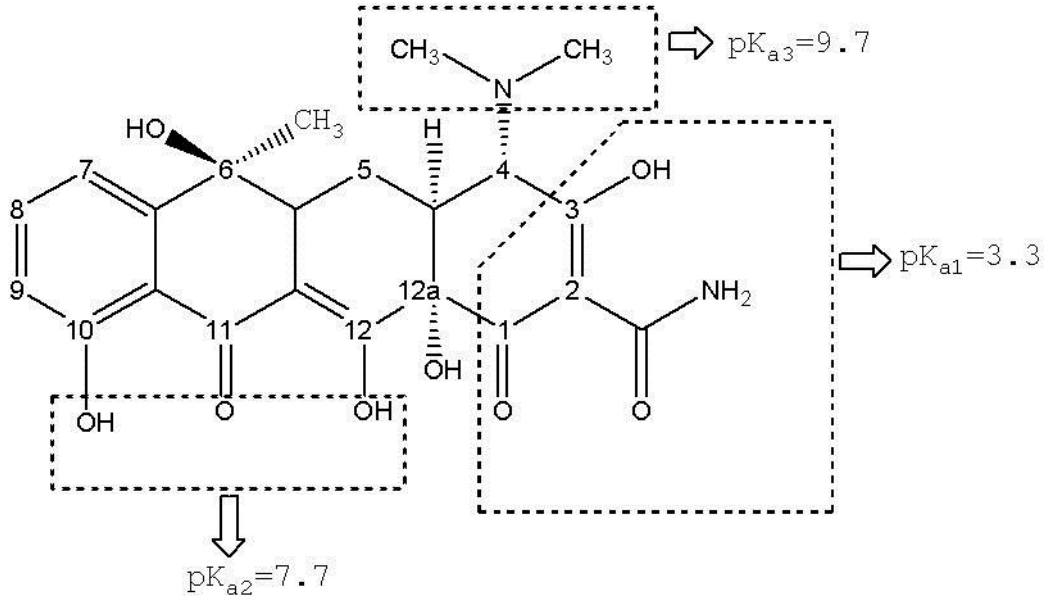

Fig.S4 Molecular structure of TC on a planar view.

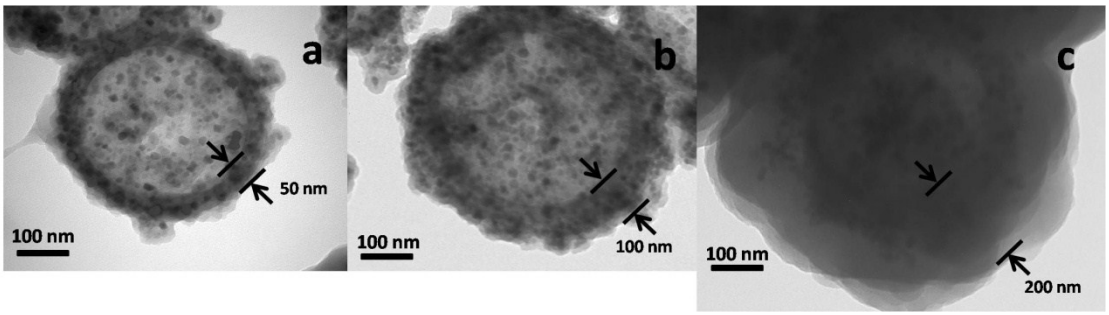

Fig. S5 Magnified TEM image of (a) Fe_3O_4@PDA (50) HSs; (b) Fe_3O_4@PDA (200) HSs and (c) Fe_3O_4@PDA (200) HSs.

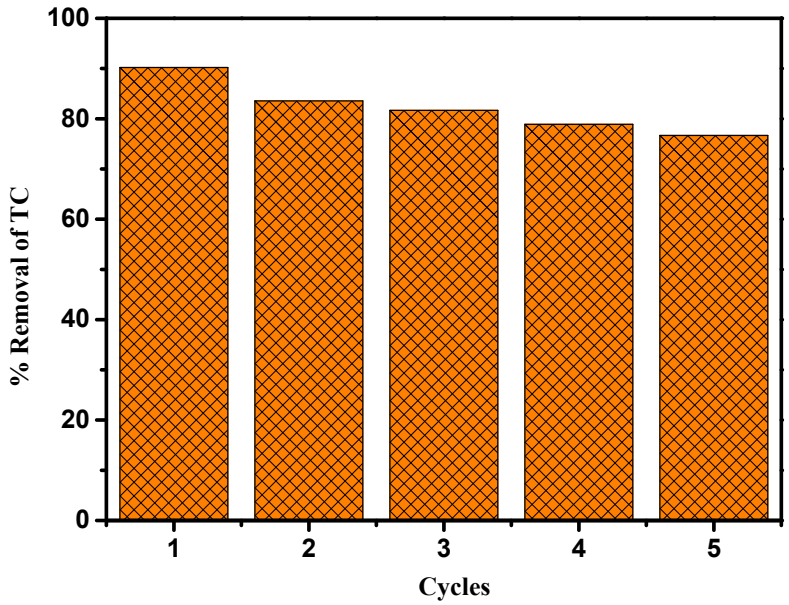

Fig. S6 Adsorption efficiency of Fe_3O_4@PDA HSs after repeated regeneration.

Table S1 The parameters derived from the Langmuir, Freundlich and Temkin.

Isotherm model	Parameters	10 °C	25 °C	40 °C
Langmuir	q_m (mg·g^{-1})	136	151	171
	K_L (×10^3 L·mg^{-1})	0.09	0.13	0.40
	R^2	0.93	0.89	0.84
Freundlich	K_F (L·g^{-1})	32.32	45.22	66.77
	n	3.45	4.00	4.43
	R^2	0.97	0.96	0.94
Temkin	K_T (L·mol^{-1})	2.37	119.42	11.91
	B_T	22.25	13.72	26.30
	R^2	0.96	0.77	0.93

Table S2 Binding Energy and Relative Content of O in Fe_3O_4@PDA HSs.

Valance state	Sample	Proposed components	Binding energy (eV)	Relative content (%)
O 1s	Fe_3O_4@PDA HSs	Fe-O	530.04	22.5
		H-O	531.5	46.9
		C-O	533.02	30.6
	TC-loaded HSs	Fe-O	530.5	44.6
		H-O	531.5	29.2
		C-O	532.4	26.2