Supporting Information

Hierarchically porous SiO_2/C hollow microspheres: a highly efficient adsorbent for Congo Red removal

Jie Wang[1], *Longya Xiao*[1], *Shuai Wen*[1], *Nuo Chen*[1], *Zhiyin Dai*[1], *Junyang Deng*[1], *Longhui Nie*[*1,2], *Jie Min*[*1]

[1]*Hubei Provincial Key Laboratory of Green Materials for Light Industry, Hubei University of Technology, Wuhan 430068, P. R. China;*

[2]*Collaborative Innovation Center of Green Light-weight Materials and Processing, Hubei University of Technology, Wuhan 430068, P. R. China;*

*Corresponding author: Tel. +86 59750482, E-mails: nielonghui@mail.hbut.edu.cn (L. Nie); whutminj@163.com (J. Min)

Table S1 Element composition and content of PHSCHMs.

Elements	Atomic %
C	88.28
O	11.26
Si	0.2
Na	0.26

Table S2 Pseudo-first-order model, pseudo-second-order model constants and correlation coefficients for adsorption of CR over PHSCHMs at 30 °C.

Initial CR concentration（mg/L）	Pseudo-first-order kinetic model		Pseudo-second-order kinetic model	
	k_1(min^{-1})	R^2	k_2(min^{-1})	R^2
20	0.0068	0.9054	0.0050	1
40	0.0056	0.8001	0.0025	0.9999
60	0.0054	0.8477	0.0017	0.9999
80	0.0058	0.8716	0.0013	0.9999
100	0.0055	0.9503	0.0010	0.9999

Table S3 Intraparticle diffusion model constants and correlation coefficients for adsorption of CR over PHSCHMs at 30 °C.

Initial CR concentration (mg/L)	Intraparticle diffusion model								
	k_{d1} (mg/g min$^{1/2}$)	k_{d2} (mg/g min$^{1/2}$)	k_{d3} (mg/g min$^{1/2}$)	C_1	C_2	C_3	$(R_1)^2$	$(R_2)^2$	$(R_3)^2$
20	87.7	6.1	0.28	0	101.8	190.2	1	0.871	0.760
40	167.6	26.0	1.31	0	177.2	363.5	1	0.943	0.782
60	241.8	29.4	1.79	0	260.7	544.3	1	0.943	0.881
80	318.2	26.7	1.09	0	373.5	757.4	1	0.868	0.818
100	395.4	33.2	3.27	0	402.2	891.7	1	0.975	0.915

Table S4 Adsorption isotherm parameters of the PHSCHMs sample.

Langmuir model				Freundlish model		
q_m/(mg·g^{-1})	K_L/(L·g^{-1})	R_L	R^2	1/n	K_F/(mg·g^{-1}) (L·g^{-1})$^{1/n}$	R^2
2512	0.79	0.0063	0.9834	0.51	968	0.9905

Figure S1 FT-IR spectra of hollow SiO_2/carbon composite microspheres before (a) and after (b) NaOH etching, and the PHSCHMs sample after adsorption of CR.

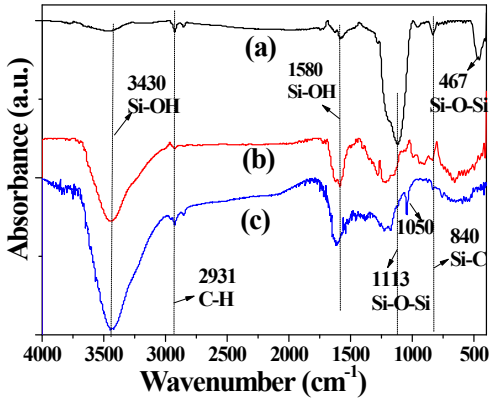

Figure S2 Zeta potential vs. pH values of the HPSCHMs sample.