

Supporting Information

Porous composite sphere CMC-KCuFC-PEG for efficient cesium removal from wastewater

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1. Characterization

1.1 FT-IR spectrum

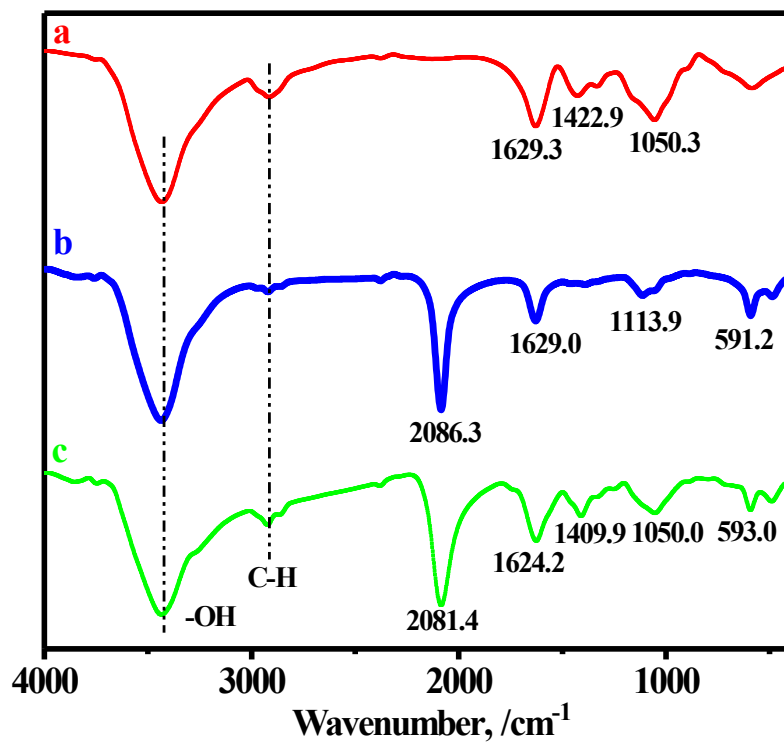


Figure S1 FT-IR spectra of (a) CMC; (b) KCuFC; (c) CMC-KCuFC-PEG.

1.2 XRD pattern

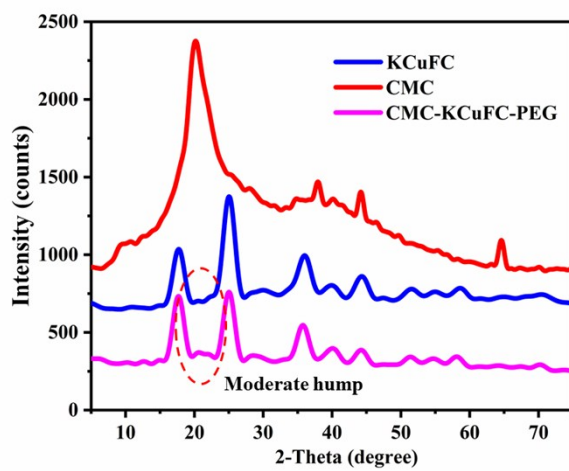


Figure S2 X-ray diffraction pattern of CMC, KCuFC and CMC-KCuFC-PEG.

1.3 TEM image

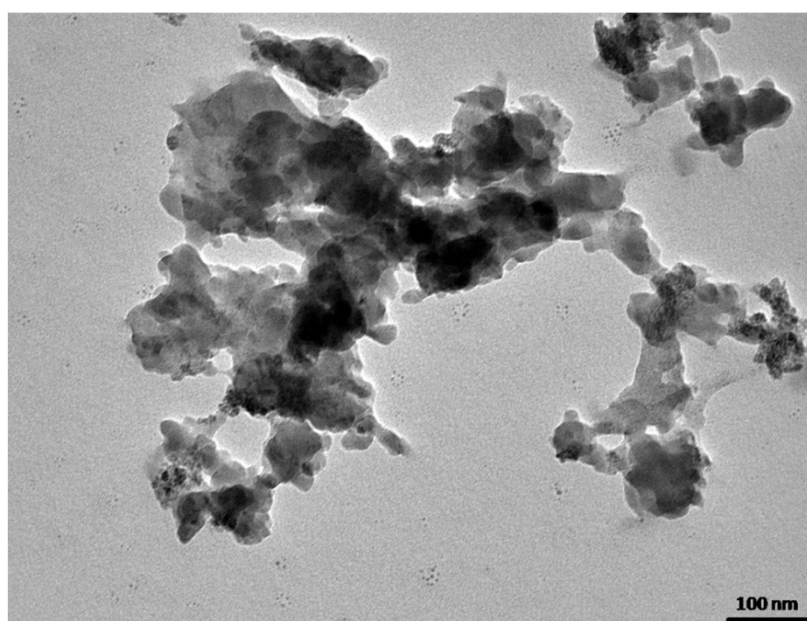


Figure S3 The TEM image of CMC-KCuFC-PEG.

1.4 SEM images

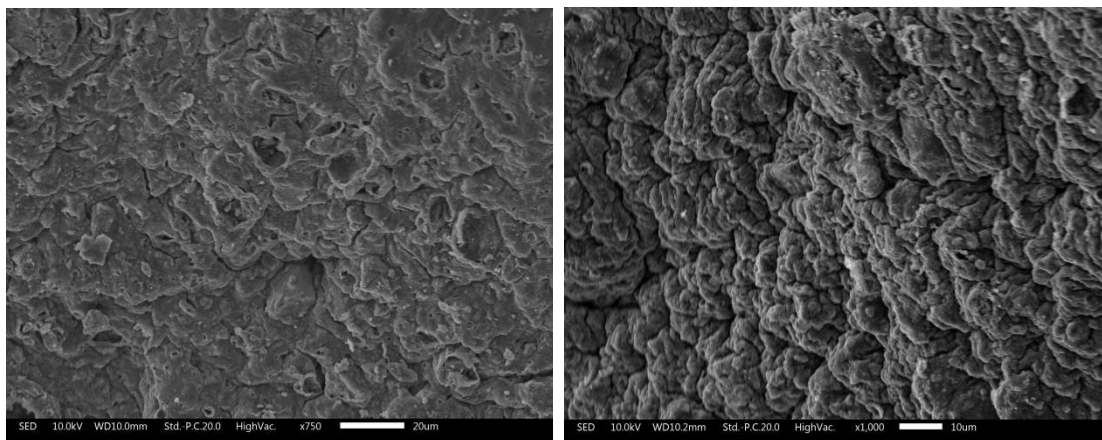


Figure S4 The more SEM image of CMC-KCuFC-PEG.

1.5 N₂ isotherm adsorption

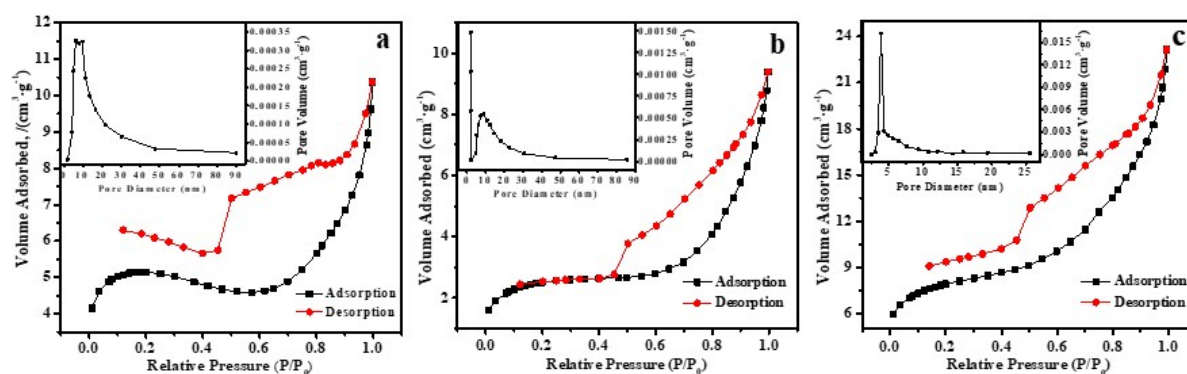


Figure S5 N₂ adsorption-desorption isotherm of CMC-KCuFC spheres with different porogens. a, without porogen; b, N₂; c, *n*-hexane.

1.6 The comparison of absorption efficiency between Cs⁺ and K⁺.

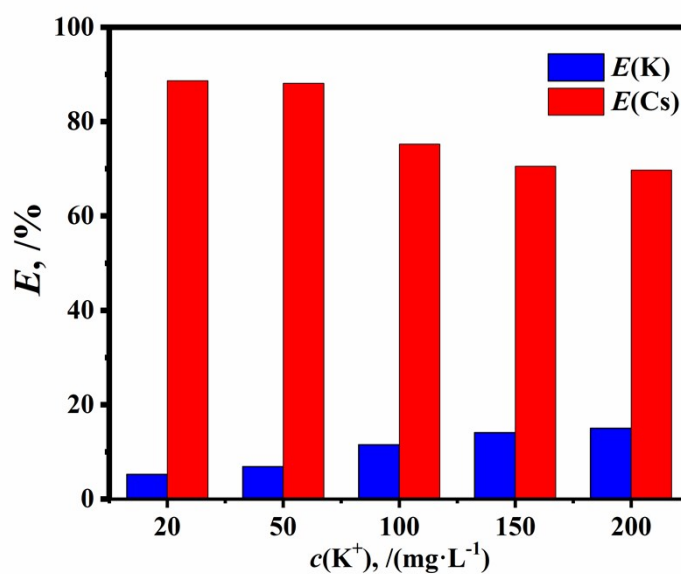


Figure S6 The comparison of absorption efficiency between Cs⁺ and K⁺.

2. Adsorption stability

Digital photo of CMC-KCuFC-PEG in NH_4^+ solution

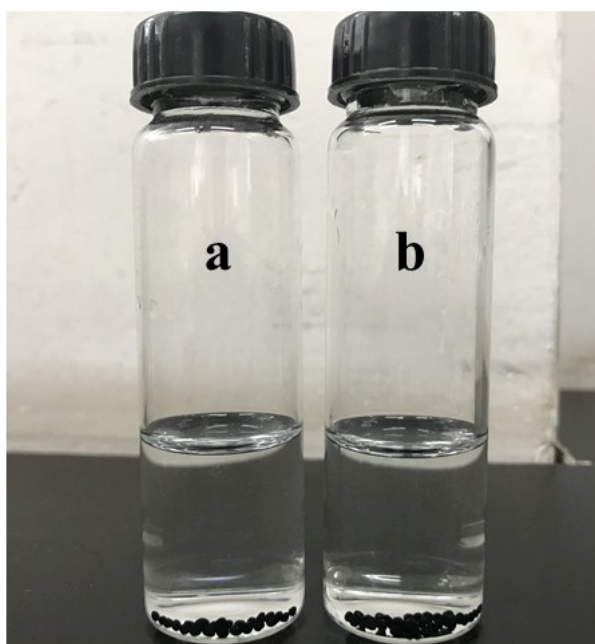


Figure S7 Digital image of CMC-KCuFC-PEG before (a) and after (b) adsorption process using Cs-containing water with 1 mol/L NH_4^+ in 10 days.

3. Adsorption isotherm parameters

Table S1 Parameters of Langmuir and Freundlich models for CMC-KCuFC-PEG.

Adsorbent	$T, /K$	Langmuir model			Freundlich model		
		$q_m,$ $/(mg \cdot g^{-1})$	$K_L,$ $/(L \cdot mg^{-1})$	R^2	$K_F, /((mg \cdot g^{-1})(L \cdot mg^{-1})^{1/n})$	n	R^2

	293.15	127.11	0.0311	0.856	20.04	3.060	0.976
CMC-	303.15	126.22	0.0540	0.944	29.07	3.710	0.987
KCuFC-	313.15	125.72	0.0919	0.869	38.57	4.443	0.890
PEG6000	323.15	149.77	0.1036	0.849	43.74	4.126	0.915
