

Figure S1. Effect of contact time on the removal of Cr(VI) (a), Weber-Morris intra-particle diffusion model (b), pseudo-first order model (c) and pseudo-second order model (d) for Cr(VI) adsorption of AMKBC_{3/4}. (pH=3, T=0-13 h, m=0.01 g, V=15 mL, C₀=100 mg L⁻¹)

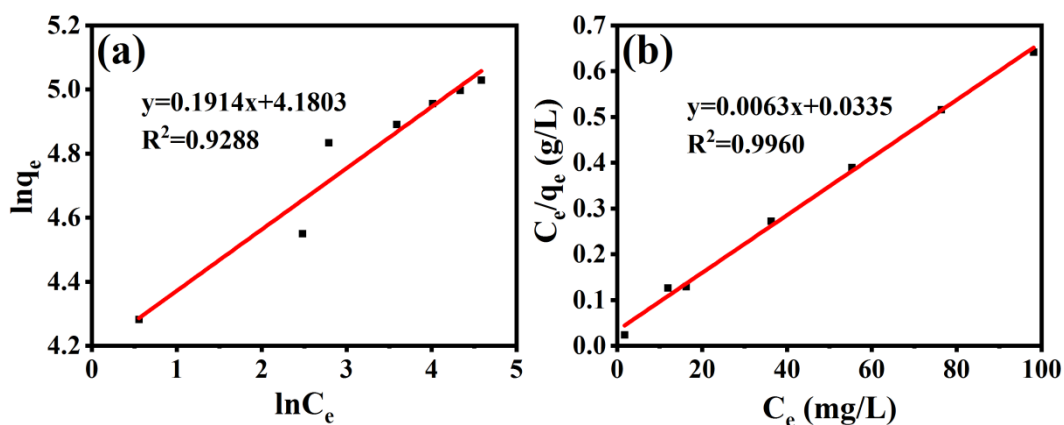


Figure S2. Langmuir isotherm (a) and Freundlich isotherm (b) for Cr(VI) adsorption of AMKBC_{3/4}. (pH=3, T=13 h, m=0.01 g, V=15 mL, C₀=50-200 mg L⁻¹)

Table S1 Elemental content of adsorbents

Adsorbent	C(wt%)	O(wt%)	Al(wt%)	Mn(wt%)
BC	86.4	13.6	/	/
KBC	92.6	7.4	/	/
AMKBC _{3/4}	83.3	11.5	4.5	0.7

Table S2. DFT calculated adsorption energy (E_{ads}, eV) of HCrO₄⁻ and Cr₂O₇²⁻ for the favored adsorption configurations on MnO (001) and Al₂O₃ (010).

-	HCrO ₄ ⁻	Cr ₂ O ₇ ²⁻
MnO(001)	-0.52	-0.21
Al ₂ O ₃ (010)	-1.64	-2.01