

Simultaneous removal of Sb(III) and Cd(II) in water by adsorption onto MnFe₂O₄-biochar nanocomposites

Yu-Ying Wang^{1,2}, Hai-Yang Ji^{1,3}, Hao-Hao Lu^{1,2}, Yu-Xue Liu^{1,2}, Rui-Qin Yang^{4,5}, Sheng-
Mao Yang^{1,2*}

¹ Institute of Environment, Resource, Soil, and Fertilizer, Zhejiang Academy of Agricultural Sciences, Hangzhou, 310021, P. R. China

² Engineering Research Center of Biochar of Zhejiang Province, Hangzhou, 310021, P. R. China

³ College of Chemistry and Life Sciences, Zhejiang Normal University, Jinhua, 321004, P. R. China

⁴ Zhejiang Provincial Collaborative Innovation Center of Agricultural Biological Resources Biochemical Manufacturing, Zhejiang University of Science and Technology, Hangzhou, 310023, P. R. China

⁵ Zhejiang Provincial Key Lab for Chem&Bio Processing Technology of Farm Product, Zhejiang University of Science and Technology, Hangzhou, 310023, P. R. China

Supplementary Materials:

Supplementary Table and Figure

Table S1 Langmuir and Freundlich parameters for Sb(III) or Cd(II) adsorbed by BC and MnFe₂O₄-BC in the single metal system.

Sample	Ion	Langmuir constants			Freundlich constants		
		K_L (L·mg ⁻¹)	q_{max} (mg·g ⁻¹)	R^2	K_F (mg·g ⁻¹)(L·mg ⁻¹) ^{1/n}	n	R^2
BC	Sb(III)	—	—	—	—	—	—
BC	Cd(II)	0.00986	99.40	0.968	2.531	1.63	0.873
MnFe ₂ O ₄ -BC	Sb(III)	0.0171	159.48	0.921	6.289	1.74	0.801
MnFe ₂ O ₄ -BC	Cd(II)	0.0598	122.10	0.990	27.69	3.89	0.866

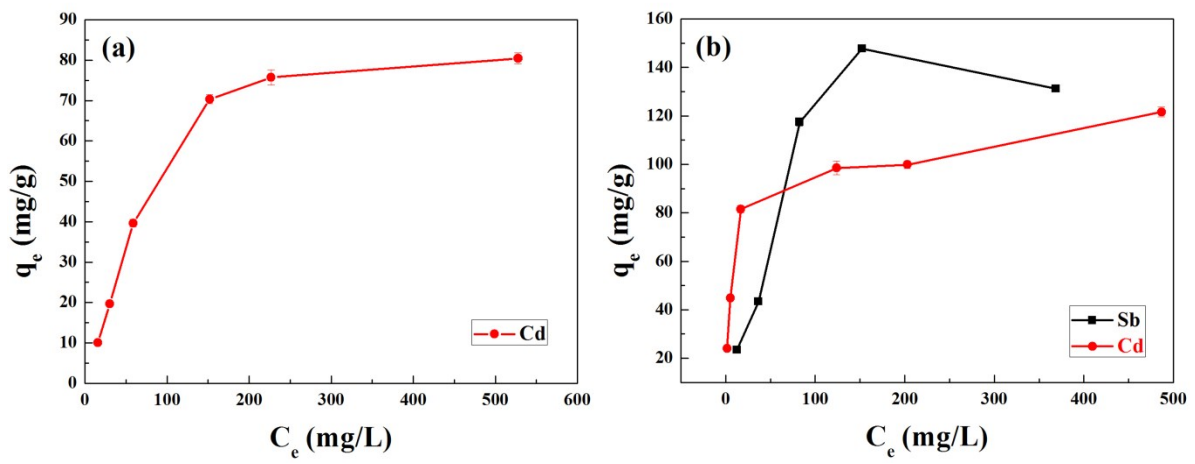


Figure S1 Effect of initial concentration on the removal of Sb (III) and Cd(II) at pH 7.0 by (a) BC and (b) MnFe₂O₄-BC in single system

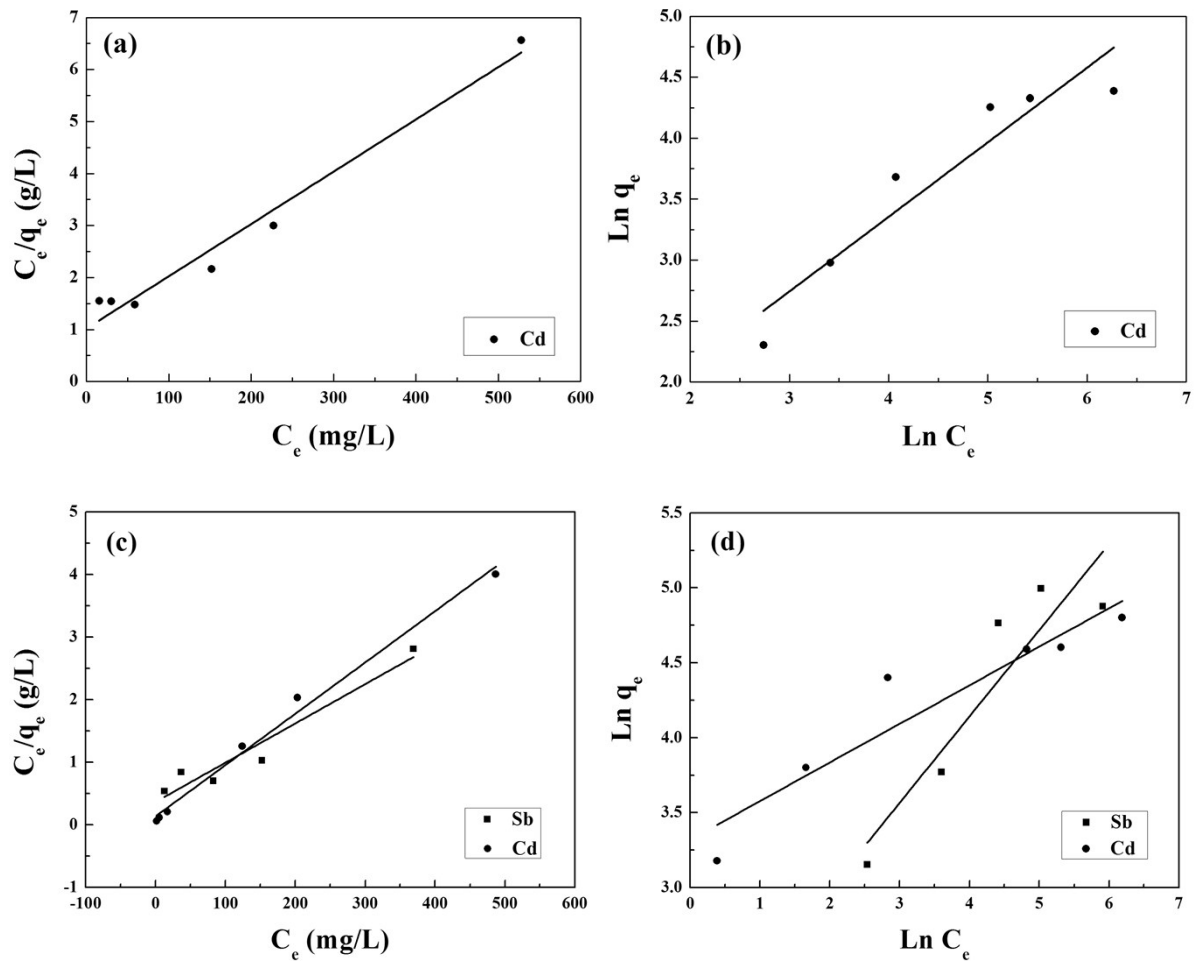


Figure S2 (a and c) Langmuir and (b and d) Freundlich isotherms for Sb (III) and Cd(II) adsorption onto (a and b) BC and (c and d) MnFe₂O₄-BC in single system.