

Supplementary Material

Recoverable magnetic surface ion-imprinted polymer based on graphene oxide for fast and selective adsorption of Ni(II) from aqueous solution: Experimental and DFT calculation

Wei-Ye Zhang^a, Si-Qing Ye^a, Xin-Tao Yang^a, Bao-Shi Zhu^a, Wei-Li Li^a, Hong-Xing He^{*a} and Xiu-Jun Deng^{*b}

^a Yunnan Key Laboratory of Food Safety Testing Technology, Kunming University, Kunming 650214, China. E-mail: hxhe0212@kmu.edu.cn

^b Yunnan Key Laboratory of Metal-Organic Molecular Materials and Device, School of Chemistry and Chemical Engineering, Kunming University, Kunming 650214, China

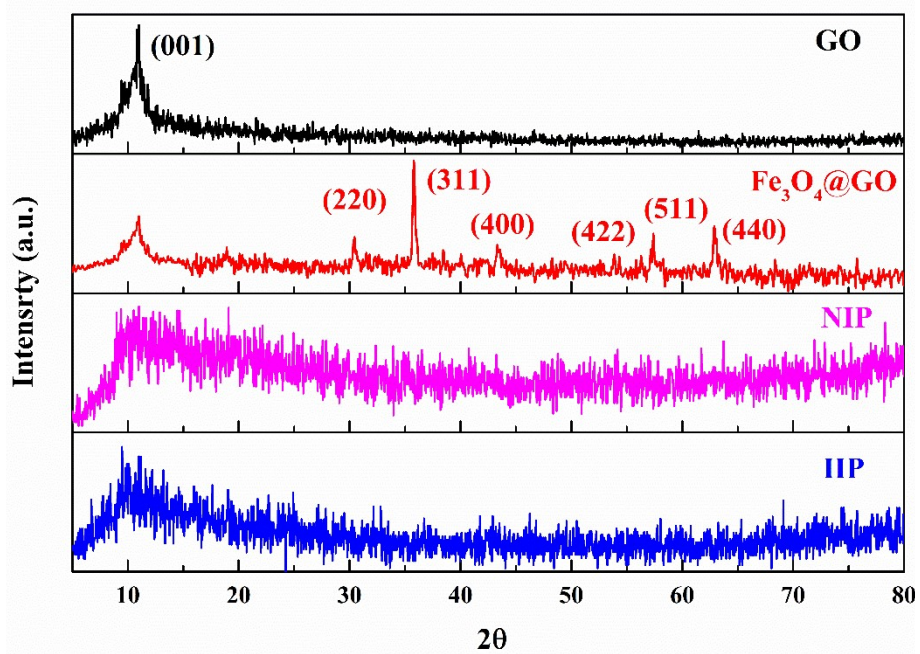


Fig. S1. XRD patterns of GO, Fe₃O₄@GO, NIP, and IIP.

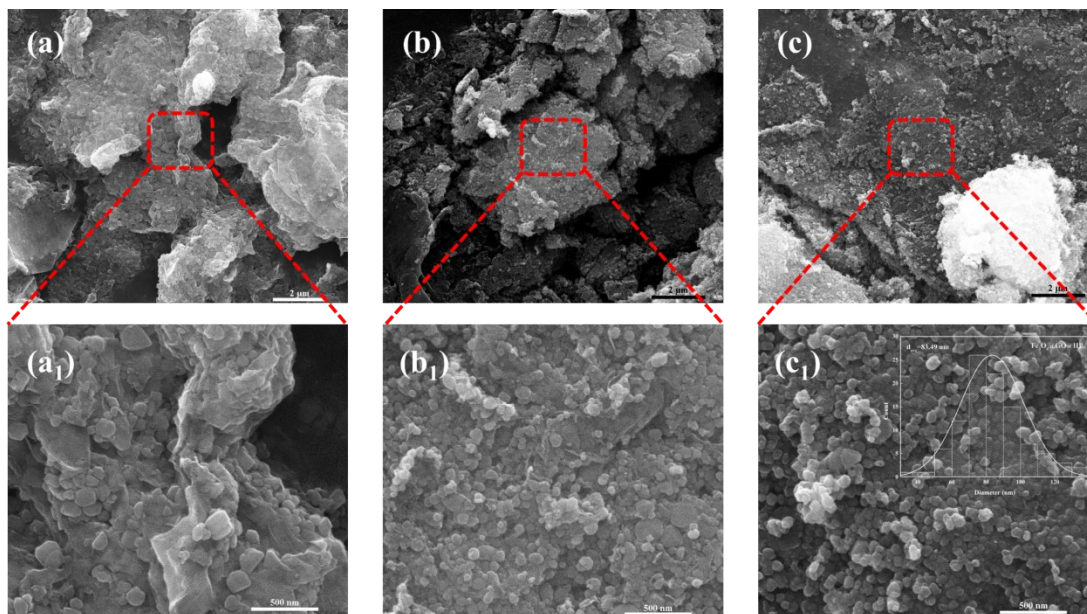


Fig. S2. SEM images of $\text{Fe}_3\text{O}_4@\text{GO}$, $\text{Fe}_3\text{O}_4@\text{GO}@\text{VTMOS}$ and IIP (a_1 , b_1 and c_1 are enlarged SEM images of a, b, and c, respectively).

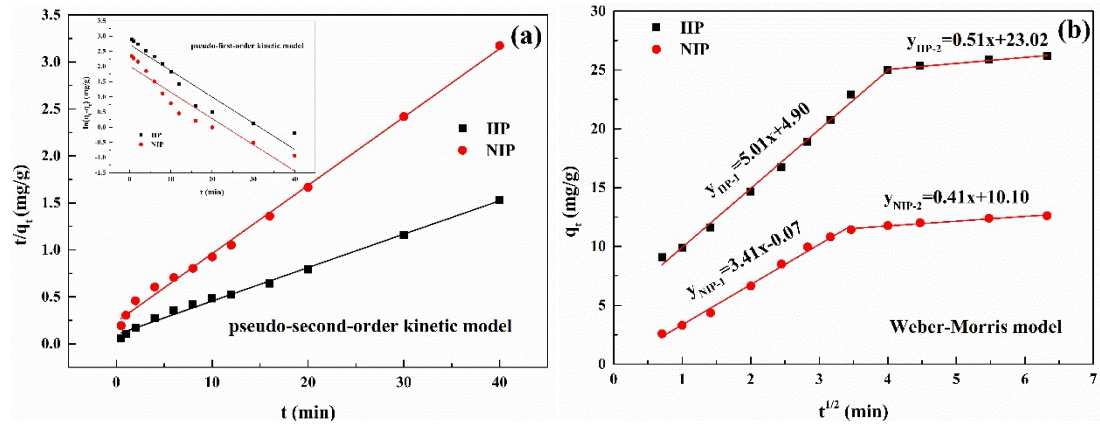


Fig. S3. (a) Pseudo-second-order kinetic model (the inset was the Pseudo-first-order kinetic model), (b) Weber-Morris intra-particle diffusion model.

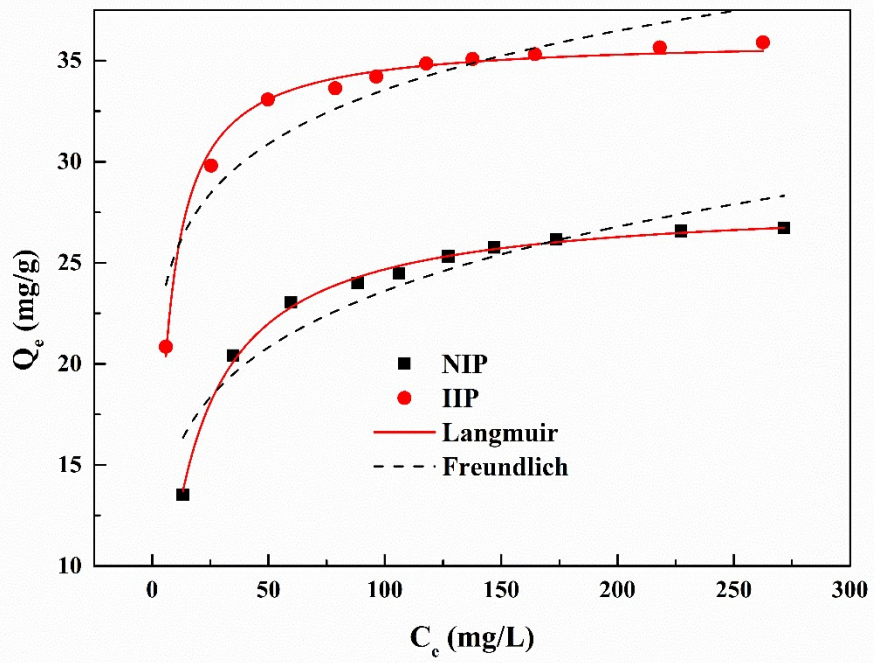


Fig. S4. Langmuir and Freundlich isotherm model.

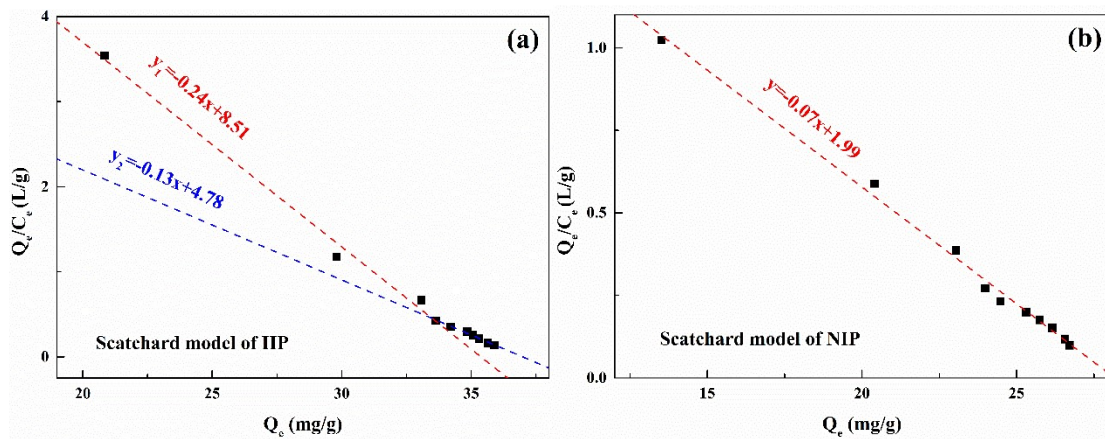


Fig. S5. Scatchard model fitting of the IIP (a) and NIP (b).

Table S1 Results of different component content and solvent preparation.

Component dosage (mmol) Ni(II)/AMPS/MBA	Solvent (mL)		Magnetism	Adsorption capacity (mg/g)
	Distilled water	Ethanol		
1/2/3	30	-	Magnetic	27.33
	10	20	Magnetic	29.13
2/4/6	30	-	Magnetic	19.85
	10	20	Magnetic	35.31
2/8/6	30	-	-	49.52
	10	20	-	54.68

Table S2. Selectivity parameters of IIP and NIP.

Metal ion	Distribution ratio		Selectivity coefficient		Relative selective coefficient (k')
	D (mL/g)		(k)		
	IIP	NIP	IIP	NIP	
Ni(II)	1312.81	337.93			
Cd(II)	91.97	107.00	14.27	3.16	4.52
Co(II)	74.71	89.39	17.57	3.78	4.65
Cu(II)	80.71	156.19	16.27	2.16	7.52
Pb(II)	120.90	195.36	10.86	1.73	6.28
Zn(II)	74.40	54.31	17.65	6.22	2.84