Table S1. Parameters estimated from the isotherm models for IIP/no CTAB. Q_{exp}= 24.48 mg g^{-1}.

Model	Equation	K_1	K_2	b_1	b_2	n_1	n_2	R^2	Sum of error squared (SSE)
Dubinin-Radushkevich	$\ln Q_{eq} = \ln Q_{max} - KE^2$	3.01x10^{-8}	-	22.04	-	-	-	0.9656	
Scatchard	$Q_{eq} / C_{eq} = Q_{eq} K_b - QK_b$	5.63	1.81	20.53	24.87	-	-	0.9850-0.9082	
Non-linear Langmuir	$Q_{eq} = KbC_{eq} / (1 + KC_{eq})$	3.81	-	23.82	-	-	-	0.9818	6.43
Non-linear Freundlich	$Q_{eq} = KC_{eq}^{1/n}$	15.33	-	-	-	0.16	-	0.8511	52.48
Single-site Langmuir-Freundlich	$Q_{eq} = b(KC_{eq})^{n_1} / 1 + (KC_{eq})^n$	3.34	-	24.92	-	0.77	-	0.9924	2.66
Dual-site Langmuir-Freundlich	$Q_{eq} = \frac{b_1 (K_1 C_{eq})^{n_1}}{1 + (K_1 C_{eq})^{n_1}} + \frac{b_2 (K_2 C_{eq})^{n_2}}{1 + (K_2 C_{eq})^{n_2}}$	8.02	0.41	17.50	6.62	1.22	2.18	0.9975	0.88

In the Langmuir and Freundlich equations: $K_{1,2}$ (Langmuir) (L g^{-1}), $K_{1,2}$ (Freundlich) (mg g^{-1}) (L g^{-1}) are the adsorbate–adsorbent affinities, $b_{1,2}$ are the maximum adsorption capacities (mg g^{-1}), and $n_{1,2}$ are the intensities or degrees of favorability for adsorption. In the Scatchard equation: K_b is the equilibrium dissociation constant. C_{eq} = equilibrium concentration (mg L^{-1}), Q_{eq} = concentration in solid phase (mg g^{-1}). In the Dubinin-Radushkevich equation: Q_{max} = b_1 (mol g^{-1}), and E = mean free energy of adsorption (mol^2 J^2).

Table S2. Parameters estimated from the isotherm models for NIP/CTAB. Q_{exp}= 29.53 mg g^{-1}.

Model	Equation	K_1	K_2	b_1	b_2	n_1	n_2	R^2	Sum of error squared (SSE)
Dubinin-Radushkevich	$\ln Q_{eq} = \ln Q_{max} - KE^2$	4.04x10^{-8}	-	22.70	-	-	-	0.8201	
Scatchard	$Q_{eq}/C_{eq} = Q_{eq}K_b - QK_b$	4.86	0.47	17.06	31.72	-	-	0.959-0.9078	
Non-linear Langmuir	$Q_{eq} = KbC_{eq}/(1+KC_{eq})$	1.01	-	29.08	-	-	-	0.9513	28.24
Non-linear Freundlich	$Q_{eq} = KC_{eq}^{1/n}$	14.17	-	-	-	0.23	-	0.9454	31.64
Single-site Langmuir-Freundlich	$Q_{eq} = b(KC_{eq})^{n_1}/1+(KC_{eq})^{n}$	0.54	-	35.22	-	0.58	-	0.9880	6.96
Dual-site Langmuir-Freundlich	$Q_{eq} = \frac{b_1(K_1C_{eq})^{n_1}}{1+(K_1C_{eq})^{n_1}} + \frac{b_2(K_2C_{eq})^{n_2}}{1+(K_2C_{eq})^{n_2}}$	1.01	0.27	28.19	4.14	0.59	97.23	0.9990	0.56

In the Langmuir and Freundlich equations: $K_{1,2}$ (Langmuir) (L g^{-1}), $K_{1,2}$ (Freundlich) (mg g^{-1}) (L g^{-1}) are the adsorbate–adsorbent affinities, $b_{1,2}$ are the maximum adsorption capacities (mg g^{-1}), and $n_{1,2}$ are the intensities or degrees of favorability for adsorption. In the Scatchard equation: K_b is the equilibrium dissociation constant. C_{eq} = equilibrium concentration (mg L^{-1}), Q_{eq} = concentration in solid phase (mg g^{-1}). In the Dubinin-Radushkevich equation: Q_{max} = b_1 (mol g^{-1}), and E = mean free energy of adsorption (mol^2 J^2).

Table S3. Parameters estimated from the isotherm models for NIP/no CTAB. Q_{exp}= 19.66 mg g^{-1}.

Model	Equation	K_1	K_2	b_1	b_2	n_1	n_2	R^2	Sum of error squared (SSE)
Dubinin-Radushkevich	$\ln Q_{eq} = \ln Q_{max} - KE^2$	8.56×10^{-8}	-	17.81	-	-	-	0.9709	
Scatchard	$Q_{eq} / C_{eq} = Q_{eq} K_b - QK_b$	1.40	0.763	19.79	20.61	-	-	0.9410-0.7896	
Non-linear Langmuir	$Q_{eq} = KbC_{eq} / (1 + KC_{eq})$	1.60	-	19.41	-	-	-	0.9781	3.98
Non-linear Freundlich	$Q_{eq} = KC_{eq}^{1/n}$	11.57	-	-	-	0.16	-	0.7503	45.4
Single-site Langmuir-Freundlich	$Q_{eq} = b(KC_{eq})^{n_1} / 1 + (KC_{eq})^n$	1.65	-	18.96	-	1.19	-	0.9837	2.96
Dual-site Langmuir-Freundlich	$Q_{eq} = \frac{b_1 (K_1 C_{eq})^{n_1}}{1 + (K_1 C_{eq})^{n_1}} + \frac{b_2 (K_2 C_{eq})^{n_2}}{1 + (K_2 C_{eq})^{n_2}}$	0.60	3.891	9.31	9.33	2.36	17.91	0.9874	2.29

In the Langmuir and Freundlich equations: $K_{1,2}$ (Langmuir) (L g^{-1}), $K_{1,2}$ (Freundlich) (mg g^{-1}) (L g^{-1}) are the adsorbate–adsorbent affinities, $b_{1,2}$ are the maximum adsorption capacities (mg g^{-1}), and $n_{1,2}$ are the intensities or degrees of favorability for adsorption. In the Scatchard equation: K_b is the equilibrium dissociation constant. C_{eq} = equilibrium concentration (mg L^{-1}), Q_{eq} = concentration in solid phase (mg g^{-1}). In the Dubinin-Radushkevich equation: Q_{max} = b_1 (mol g^{-1}), and E = mean free energy of adsorption (mol^2 J^2).

Table S4. Comparison between the maximum Ni^{2+} adsorption capacities of IIP/CTAB and other adsorbents.

Adsorbent	Maximum adsorption capacity (mg g^{-1})	Reference
Hierarchically hybrid organic-inorganic polymer	5.44	(13)
Cashew nut	18.87	(24)
Activated carbon prepared from *Parthenium hysterophorus L*	17.24	(25)
5,7-dichloroquinone-8-ol embedded styrene–ethylene glycol dimethacrylate polymer particles	7.05	(26)
Amberlite XAD-2000	6.30	(27)
Irish peat	14.50	(28)
Poly(EGDMA-MAH/Ni(II))	9.37	(29)
Poly-5-vynil-8-hydroxiquinoline	1.98	(30)
Ni(II)-imprinted amino-functionalized silica gel sorbent	12.61	(31)
Double-imprinted poly(methacrylic acid)	33.84	Present work

Table S5. Metal concentrations from simulated electroplating effluent before and after adsorption process using batch procedure under optimized condition.

Metal	Before adsorption (mg L^{-1})	After adsorption (mg L^{-1})	Adsorption percentage (%)	$Q_{adsorbed}$ (mg g^{-1})
Ni^{2+}	17.8	2.67	85.0	15.13
Cu^{2+}	0.5	0.05	90.0	0.45
Cr^{3+}	1.2	0.21	82.5	0.99
Zn^{2+}	0.8	0.08	90.0	0.72