

Supporting Information

Pd(II)-imprinted chitosan adsorbent for selective adsorption of Pd(II): Optimizing the imprinting process through Box-Behnken experimental design

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Table S1. Sequential model fitting results.

Sequential model sum of squares						
Source	Sum of squares	df	Mean square	F-value	Prob > F	comment
Mean vs Total	25883.53	1	25883.53			
Linear vs Mean	8453.15	3	2817.72	15.69	0.0001	
2FI vs Linear	616.53	3	205.51	1.20	0.3603	
<u>Quadratic vs 2FI</u>	<u>1683.82</u>	<u>3</u>	<u>561.27</u>	<u>116.07</u>	<u>< 0.0001</u>	<u>Suggested</u>
Cubic vs Quadratic	25.64	3	8.55	4.16	0.1010	Aliased
Residual	8.21	4	2.05			
Total	36670.88	17	2157.11			
Lack of fit tests						
Source	Sum of squares	df	Mean square	F-value	Prob > F	
Linear	2325.99	9	258.44	125.87	0.0002	
2FI	1709.46	6	284.91	138.76	0.0001	
<u>Quadratic</u>	<u>25.64</u>	<u>3</u>	<u>8.55</u>	<u>4.16</u>	<u>0.1010</u>	<u>Suggested</u>
Cubic	0.00	0				Aliased
Pure Error	8.21	4	2.05327			
Model summary statistics						
Source	Std. dev.	R ²	Adjusted R ²	Predicted R ²	PRESS	
Linear	13.40	0.7836	0.7337	0.6117	4188.22	
2FI	13.11	0.8408	0.7452	0.4508	5923.96	
<u>Quadratic</u>	<u>2.20</u>	<u>0.9969</u>	<u>0.9928</u>	<u>0.9608</u>	<u>423.00</u>	<u>Suggested</u>
Cubic	1.43	0.9992	0.9970			Aliased

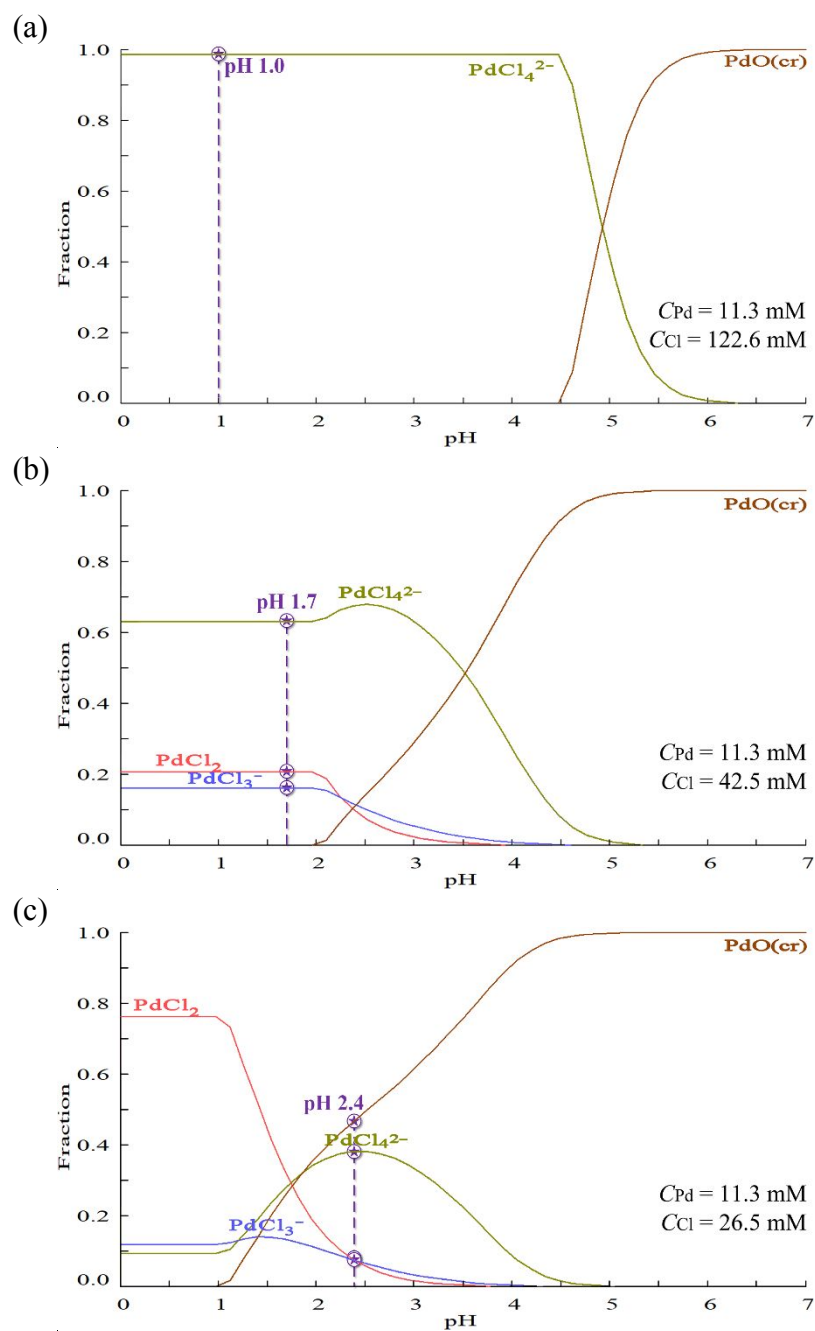


Figure S1. The equilibrium diagrams for 1200 mg L^{-1} Pd(II) ($C_{Pd} = 11.3 \text{ mM}$) solutions with various concentration of Cl^- . The diagrams were obtained by the program of MEDUSA (Royal Institute of Technology, Sweden). ($PdCl_2$ dissolving in diluted hydrochloric acid solutions at pH 1.0 (a), pH 1.7 (b) and pH 2.4 (c) contain 122.6 mM, 42.5 mM and 26.5 mM of Cl^- , respectively)

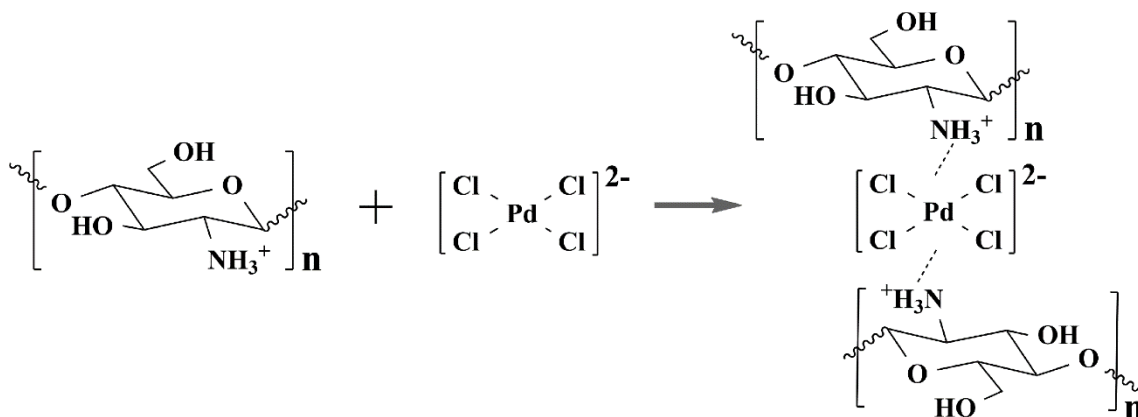


Figure S2. Amine groups of chitosan bind with PdCl_4^{2-} .

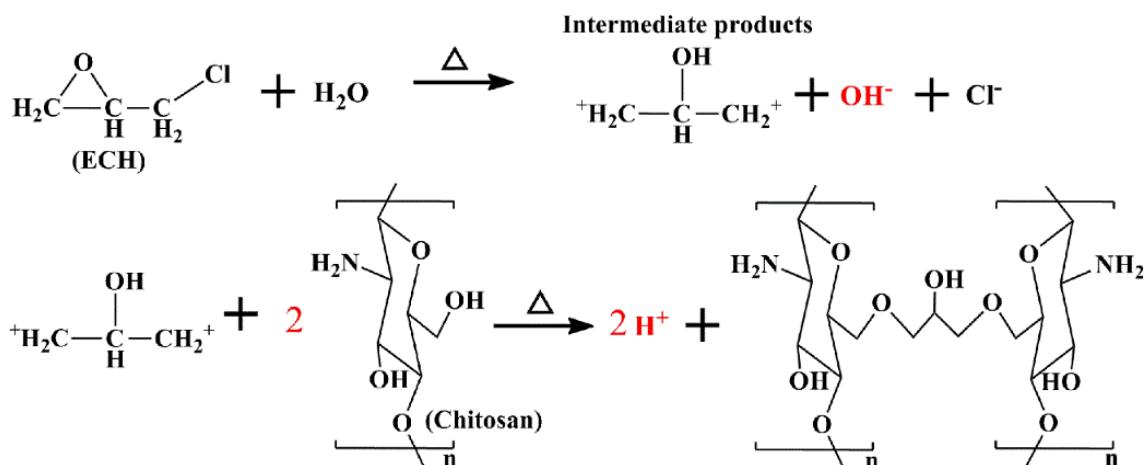


Figure S3. ECH crosslinking reactions with chitosan.

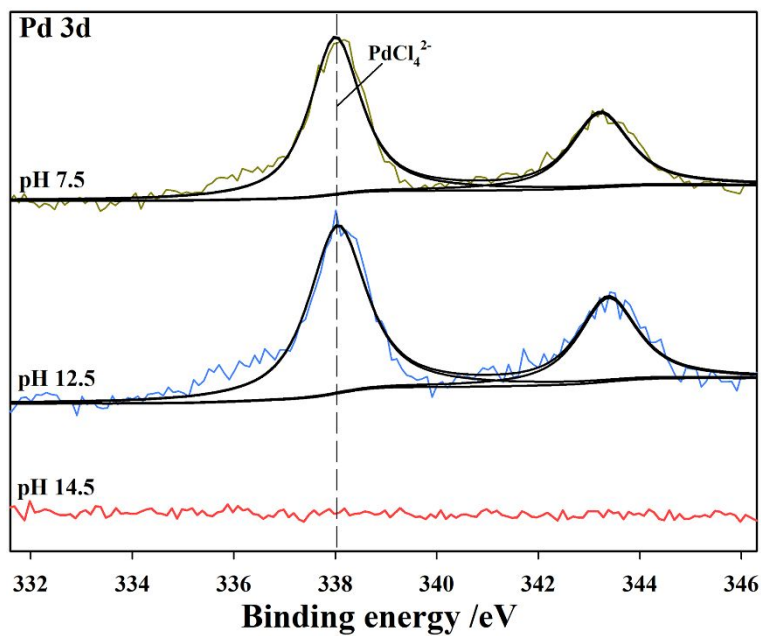


Figure S4. XPS Pd 3d spectra of chitosan fibers after second crosslinking in ECH solutions with pH at 7.5, 12.5 and 14.5.

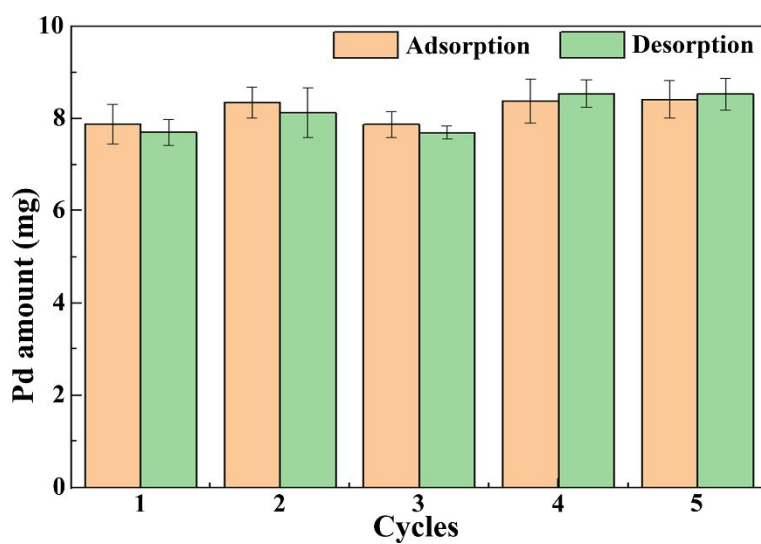


Figure S5. Adsorption and desorption cycles of ICA for Pd(II).