

Supplementary Materials: Hydrophilic Molecularly Imprinted Chitosan Based on Deep Eutectic Solvents for the Enrichment of Gallic Acid in Red Ginseng Tea

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Table S1 Density (ρ), viscosity (μ), and conductivity (σ) of the three kinds of DESs at 293.15 K and atmospheric pressure (1.01 bar).

Abbreviations	Molar ratios (HBA:	Density	Viscosity	Conductivity ($\mu\text{S}\cdot\text{cm}^{-1}$)
	HBD)	($\text{g}\cdot\text{cm}^{-3}$)	(Pa·S)	
DES-1	1:1	1.1432	0.1896	1205.6
DES-2	1:2	1.1601	0.2042	1187.4
DES-3	1:3	1.1865	0.2146	1158.7

Table S2 Independent variables their levels used for BBD.

Variables	Level		
	-1	0	1
Extraction time (min) (X_1)	30	40	50
Ratio of solid to liquid ($\text{mg}\cdot\text{mL}^{-1}$) (X_2)	20	30	40
Cycles for adsorption/desorption (X_3)	1	5	9

Table S3 Central composite experimental design with the independent variables.

Run	Extraction recovery (%)				
	X ₁	X ₂	X ₃	Actual values	Predicted values
1	-1	0	-1	86.3	86.0
2	0	0	0	93.2	92.4
3	-1	1	0	92.6	91.1
4	1	-1	0	93.8	94.3
5	0	1	1	90.2	89.6
6	0	-1	1	93.1	91.8
7	1	0	1	90.8	90.1
8	-1	-1	0	94.6	93.8
9	1	0	-1	86.7	85.1
10	0	-1	-1	89.3	88.9
11	0	0	0	93.6	92.4
12	0	1	-1	85.4	85.5
13	1	1	0	91.9	91.7
14	0	0	0	92.0	92.4
15	0	0	0	92.7	92.4
16	-1	0	1	87.4	87.9
17	0	0	0	92.2	92.4

Table S4 Analysis of variance of the experimental results of the BBD.

Variables	Sum of Squares	Diversfication Factors	Mean Square	F Value	p value Probability>F
Model	129.47	9	14.39	13.47	<0.0001
X ₁	0.66	1	0.66	0.62	0.4572
X ₂	14.31	1	14.31	13.40	0.0081
X ₃	23.80	1	23.80	22.29	0.0022
X ₁ X ₂	2.500E-003	1	2.500E-003	2.341E-003	0.9628
X ₁ X ₃	2.25	1	2.25	2.11	0.1899
X ₂ X ₃	0.25	1	0.25	0.23	0.6433
X ₁ ²	2.05	1	2.05	1.92	0.2086
X ₂ ²	4.23	1	4.23	3.96	0.0868
X ₃ ²	82.35	1	82.35	77.11	<0.0001
Residual	7.48	7	1.07	-	-
Lack of fit	6.01	3	2.00	5.46	0.0674
Pure error	1.47	4	0.37	-	-
Correlation total	136.94	16	-	-	-

Table S5 Analysis of variance for the fitted quadratic polynomial model of extraction of GA.

Item	Standard deviation	Mean	Coefficient		Adjusted coefficient	Predicted coefficient	Adequate precision
			variation %	Press			
Value	1.03	90.98	1.14	98.41	0.9454	0.8752	11.623

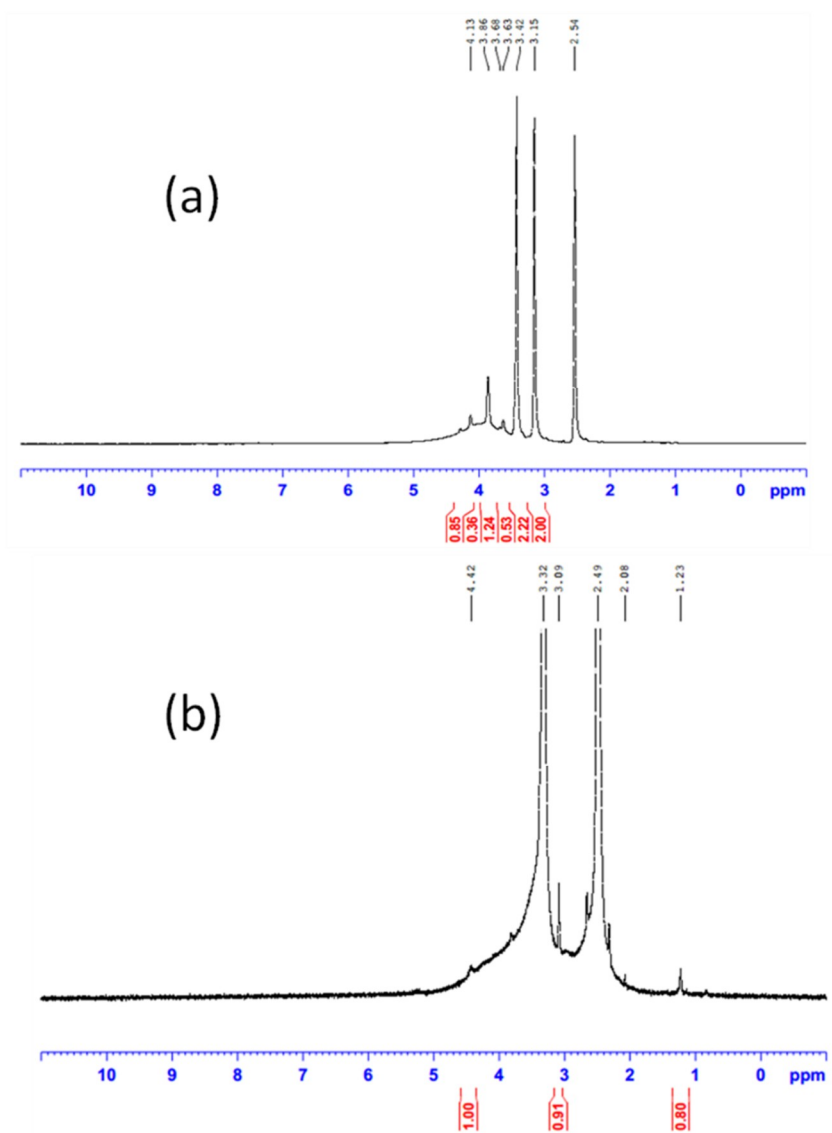


Figure S1 ¹H NMR spectra of the HMICS (a) and NICS (b).