

Supporting information

Dissolvable hierarchical layered double hydroxide templated from porous zeolitic imidazolate framework-67 for dispersive solid phase extraction of bisphenol A

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Table S1.

Experimental variables and levels of the Plackett–Burman design

Factor	Name	Levels	
		Min	Max
		(-1)	(+1)
A	Sorbent amount (mg)	3	9
B	pH	8	10
C	Extraction time (min)	5	20
D	Desorption volume (μL)	25	90

Table S2.

The matrix of the Plackett–Burman design experiments and the responses (peak area).

Experiment al number	Factors				R
	Sorbent amount (mg)	pH	Extraction time (min)	Desorption volume (μ L)	
1	1	-1	-1	-1	899
2	1	-1	1	-1	902
3	1	1	-1	1	634
4	-1	-1	-1	1	530
5	-1	1	1	-1	840
6	-1	-1	1	1	530
7	1	1	-1	1	640
8	1	-1	1	1	610
9	-1	-1	-1	-1	820
10	-1	1	1	1	550
11	-1	1	-1	-1	830
12	1	1	1	-1	876

Table S3.

Analysis of the variance for the fit of the experimental data to Plackett–Burman design

Source	Degree of freedom (D.F)	Sum of squares (seq. SS)	Adjusted sum of squares (adj. SS)	Adjusted mean squares (adj. MS)	<i>F</i> -value	<i>p</i> -Value
Main Effects	4	251643	251643	62911	334.31	0.000
Sorbent amount	1	17710	17710	17710	94.11	0.000
pH	1	520	520	520	2.76	0.140
Extraction time	1	169	169	169	0.90	0.375
Desorption volume	1	233244	233244	233244	1239.48	0.000
Residual Error	7	1317	1317	188	-	
Lack of fit	6	1299	1299	217	12.03	0.217
Pure error	1	18	18	18	-	
Total	11	252960				

Table S4.

Experimental variables and levels of the Central-Composite design (CCD).

Factor	Name	Levels				
		(-1.41)	(-1)	(0)	(+1)	(+1.41)
A	Sorbent amount (mg)	3	4	6	8	9
B	Desorption volume (μL)	25	40	60	75	90

Table S5.

The matrix of the Central-Composite design experiments obtained from MINITAB and the responses (peak area).

Experimental number	Factors		Response
	Sorbent amount	Desorption time	
1	-1.00000	1.00000	850
2	1.00000	-1.00000	945
3	0.00000	0.00000	840
4	1.00000	1.00000	919
5	-1.41421	0.00000	658
6	0.00000	0.00000	850
7	0.00000	-1.41421	1235
8	-1.00000	-1.00000	975
9	0.00000	1.41421	1120
10	0.00000	0.00000	840
11	1.41421	0.00000	670
12	0.00000	0.00000	840
13	0.00000	0.00000	860

Table S6.

Analysis of the variance for the fit of the experimental data to response surface model

Source	Degree of freedom (D.F)	Sum of squares (seq. SS)	Adjusted sum of squares (adj. SS)	Adjusted mean squares (adj. MS)	<i>F</i> -value	<i>p</i> -Value
Regression	5	296359	296359	59272	1031.89	0.000
Linear	2	12687	12687	6344	110.44	0.000
Sorbent amount	1	392	392	392	6.82	0.035
Desorption volume	1	12296	12296	12296	214.06	0.000
Square	2	281221	281221	140611	2447.94	0.000
Sorbent amount* Sorbent amount	1	89239	57133	57133	994.65	0.000
Desorption volume* Desorption volume	1	191983	191983	191983	3342.3	0.000
Interaction	1	2450	2450	2450	42.66	0.000
Sorbent amount* Desorption volume	1	2450	2450	2450	42.66	0.005
Residual Error	7	402	402	57		
Lack-of-Fit	3	82	82	27	0.34	0.798
Pure Error	4	320	320	80		
Total	12	296761				
R ² = 0.9986						
R ² –pred = 0.9963						
R ² –adjusted = 0.9977						

Figure caption

Figure S1. XRD of prepared hierarchical ZIF-67.

Figure S2. EDX of prepared Ni-Co-HLDH.

Figure S3. Pareto charts of the main effects obtained from the Plackett–Burman design.

Figure S4. Response surface plot of the sorbent amount vs. the desorption volume.

Figure S5. Extraction efficiency of BPA obtained by prepared HLDH and LDH under the achieved optimum condition.

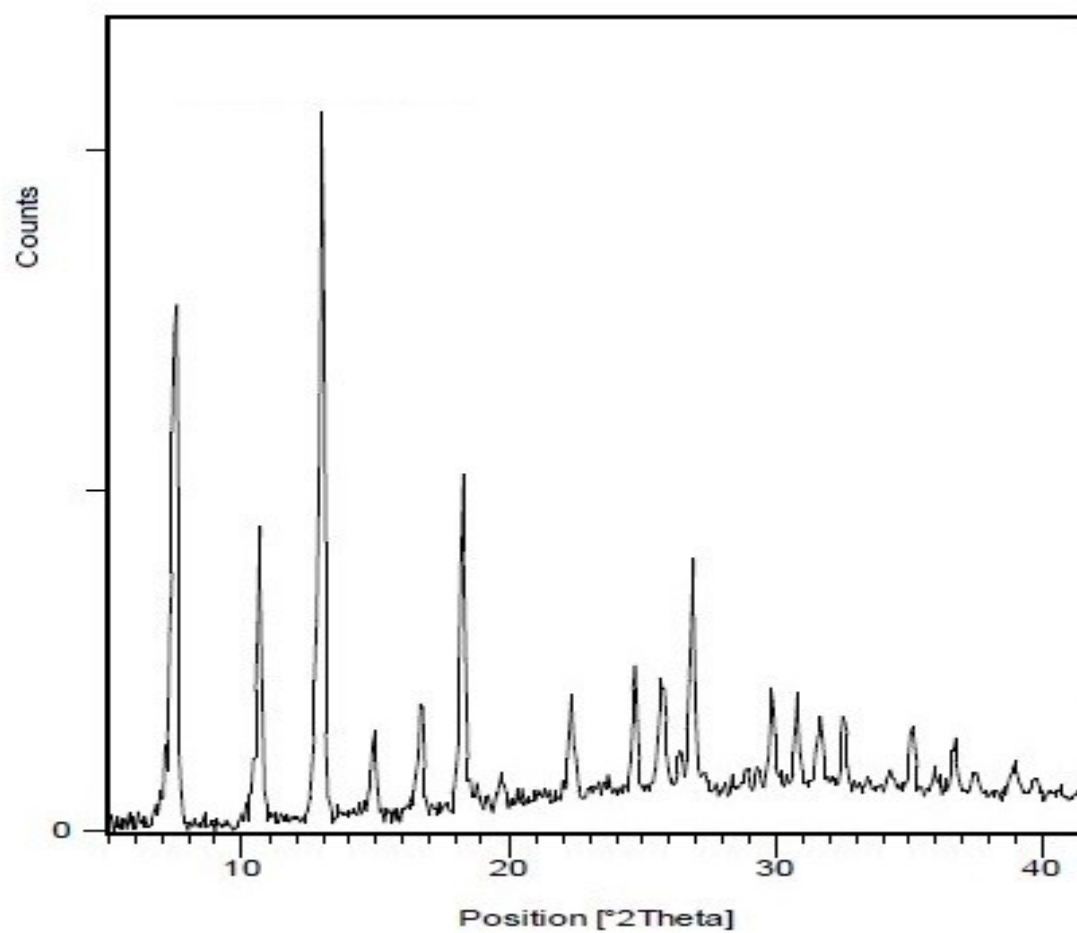


Fig. S1

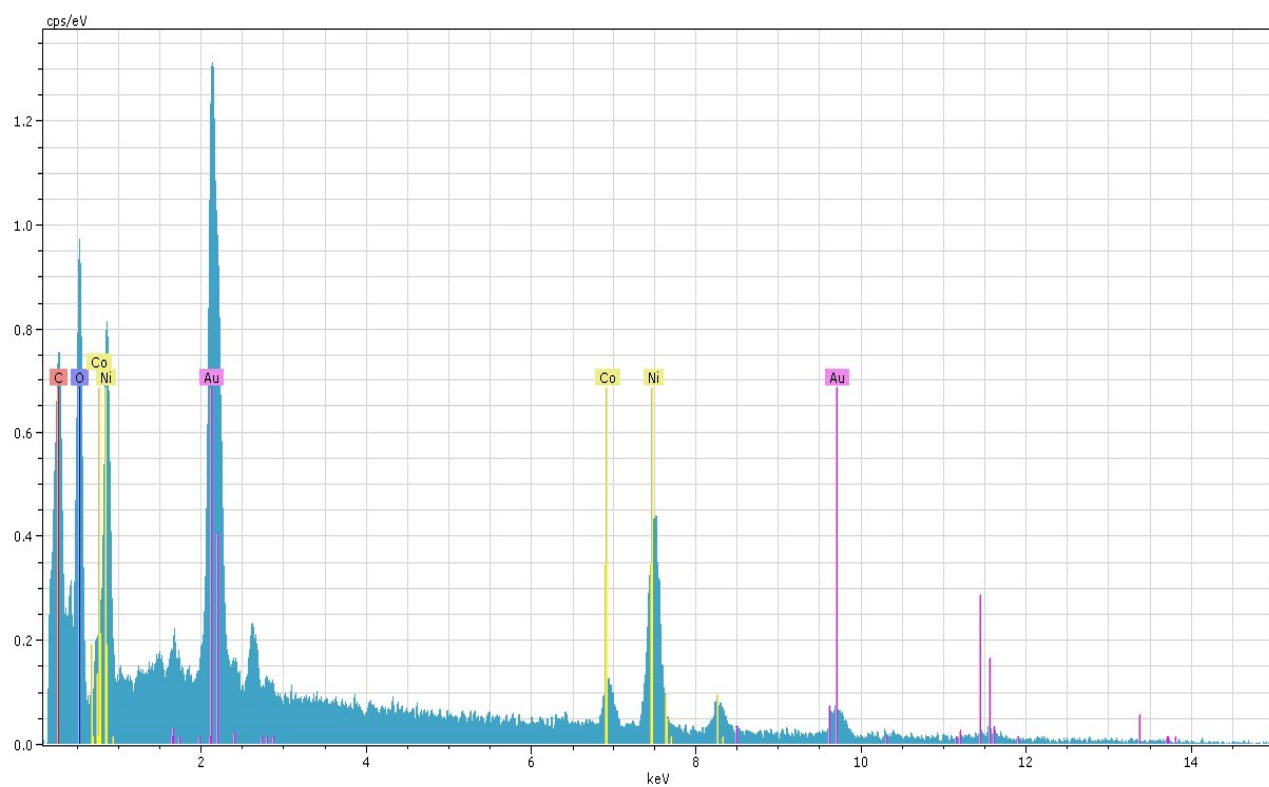


Fig.S2

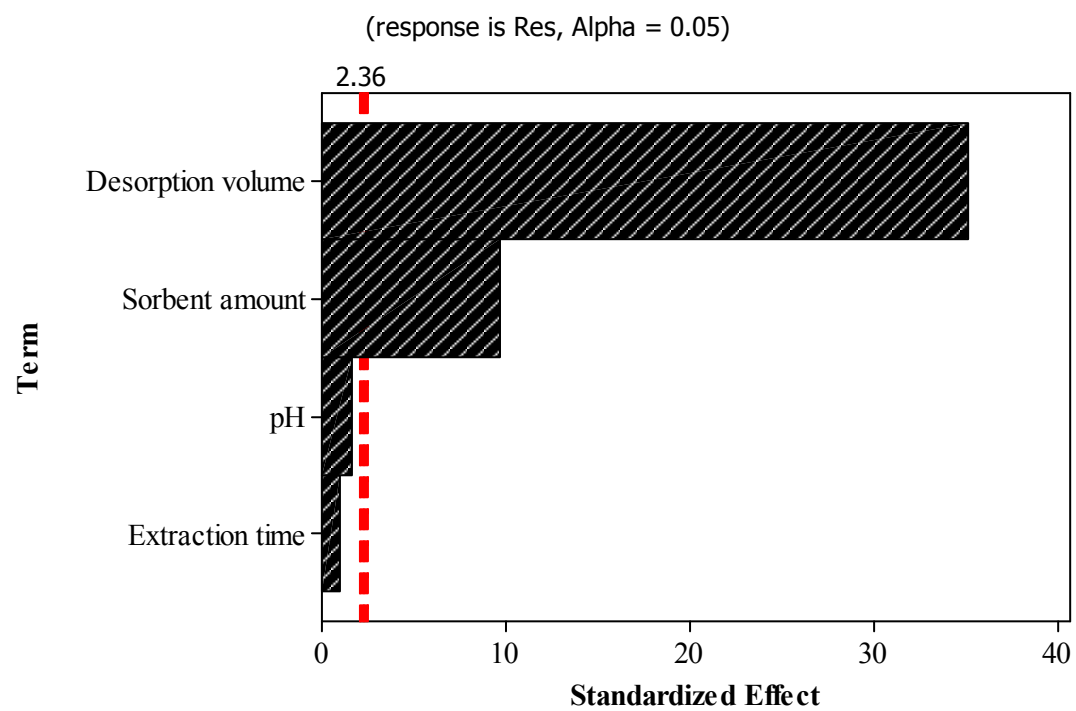


Fig. S3

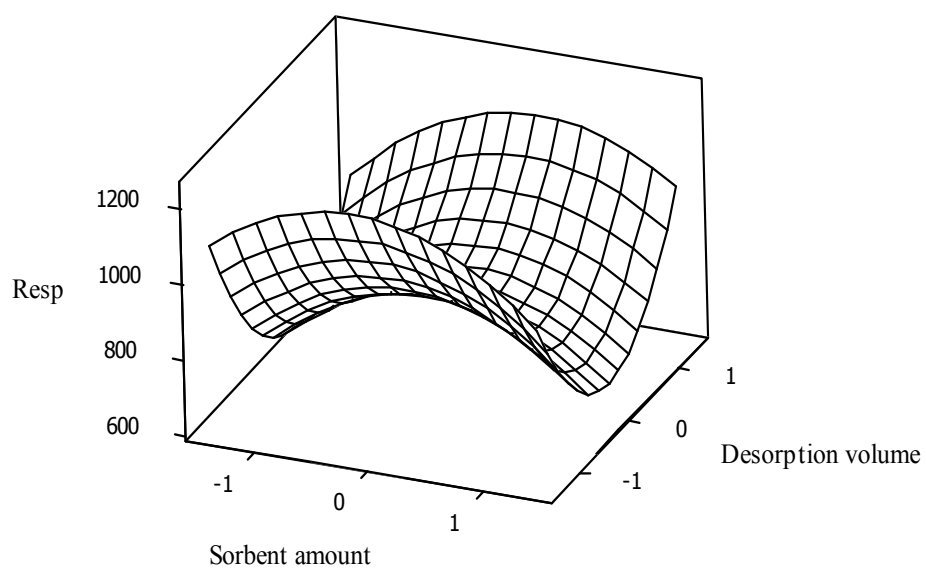


Fig. S4

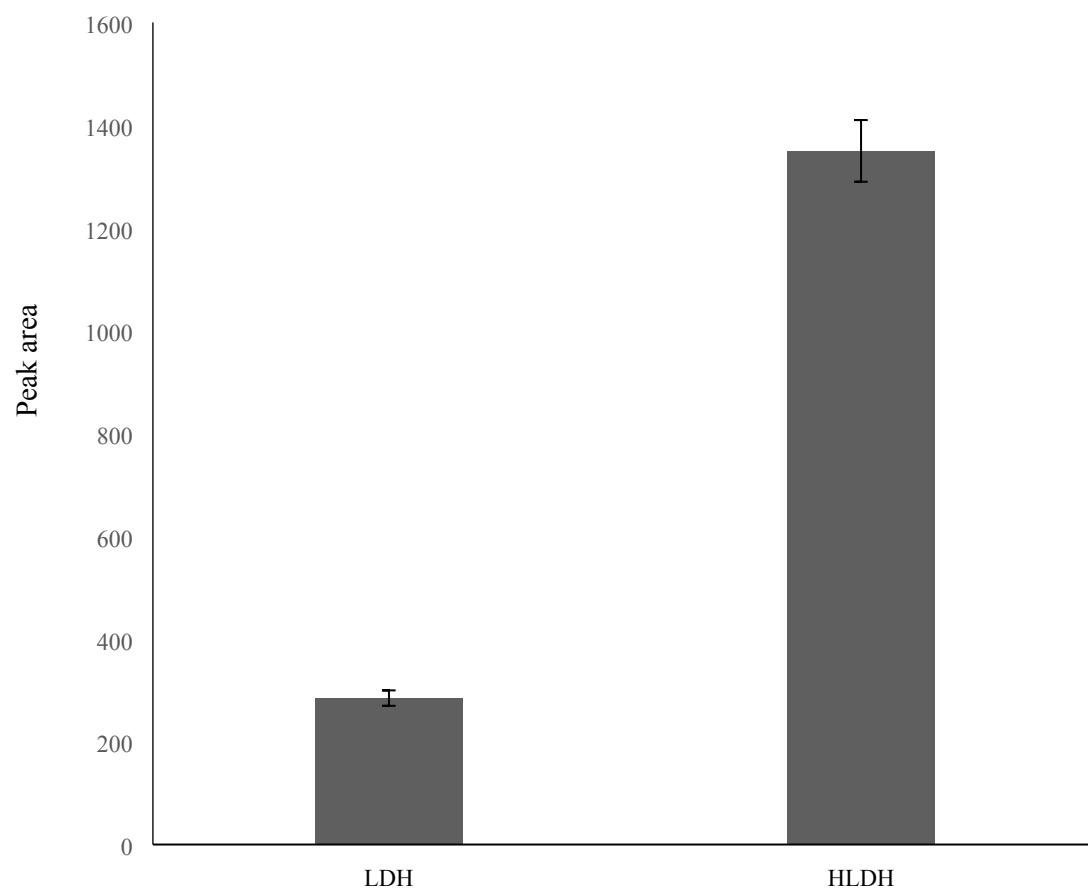


Fig. S5