

SUPPORTING INFORMATION

Magnetic three-dimensional graphene skeleton as a fast mass transport network for solid-phase extraction of polycyclic aromatic hydrocarbons coupled to gas chromatography-mass spectrometry selected ion monitoring

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Table S1. The main parameters, their symbols and levels in the central composite design.

Parameter	Symbol	Levels				
		$-\alpha^a$	-1	0 ^b	+1	$+\alpha^a$
Adsorbent dosage (mg)	A	5	10	17.5	25	30
Extraction time (min)	T	1	4.8	10.5	16	20
Salt concentration (% w/v)	S	0	3	7.5	12	15

^a Axial points with ± 1.682 unit from the center. ^b Center point.

Table S2. Design matrix for the central composite design.

Run #	Block #	A ^a	S ^b	T ^c	Response ^d
1	1	17	7.5	10.5	4965
2	1	10	3.0	4.9	5037
3	1	25	3.0	16.2	4971
4	1	10	12.0	16.2	5142
5	1	17	7.5	10.5	4241

6	1	25	12.0	4.9	2976
7	2	25	12.0	16.2	3947
8	2	10	3.0	16.2	4331
9	2	10	12.0	4.9	4591
10	2	25	3.0	4.9	5326
11	2	17	7.5	10.5	4799
12	2	17	7.5	10.5	5542
13	3	17	7.5	10.5	5178
14	3	17	7.5	10.5	5173
15	3	17	7.5	1.0	4789
16	3	17	15.0	10.5	4879
17	3	17	7.5	10.5	4844
18	3	30	7.5	10.5	3350
19	3	5	7.5	10.5	4998
20	3	17	7.5	10.5	5289
21	3	17	7.5	20.0	4727
22	3	17	0.0	10.5	4499
23	3	17	7.5	10.5	5633

^a Adsorbent (mg). ^b Salt concentration (w/v, %). ^c Extraction time (min). ^d Total chromatographic peak area.

Table S3. Analysis of variance (ANOVA) for the central composite design.

Source	Sum of Squares ^a	d.f. ^b	Mean Square ^c	F value ^d	p-value ^e	Significance
Block	3.09×10 ⁵	2	1.55×10 ⁵			
Model	7.80×10 ⁶	7	1.11×10 ⁶	41.45	< 0.0001	Significant
A	2.19×10 ⁶	1	2.19×10 ⁶	81.32	< 0.0001	Significant
S	5.88×10 ⁵	1	5.88×10 ⁵	21.87	0.0004	
T	7.51×10 ³	1	7.51×10 ³	0.27	0.606	

AS	1.71×10^6	1	1.71×10^6	63.72	< 0.0001	Significant
ST	1.44×10^6	1	1.44×10^6	53.61	< 0.0001	Significant
A ²	1.66×10^6	1	1.66×10^6	61.82	< 0.0001	Significant
C ²	2.21×10^5	1	2.21×10^5	8.20	0.0133	
Residual ^f	3.49×10^5	13	2.69×10^4			
Lack of Fit ^g	2.10×10^5	7	3.00×10^4	1.29	0.385	not significant
Pure Error ^h	1.39×10^5	6	2.32×10^4			
Corrected Total ⁱ	8.46×10^6	22				

^a Sum of the squared differences between the average values and the overall mean. ^b Degrees of freedom. ^c Sum of squares divided by d.f. ^d Test for comparing term variance with residual (error) variance. ^e Probability of seeing the observed F-value if the null hypothesis is true. ^f Consists of terms used to estimate experimental error. ^g Variation of the data around the fitted model. ^h Variation in the response in replicated design points. ⁱ Totals of all information corrected for the mean.