

## 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 <sup>b</sup>	+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

<sup>a</sup> Axial points with  $\pm 1.682$  unit from the center. <sup>b</sup> Center point.

**Table S2.** Design matrix for the central composite design.

Run #	Block #	A <sup>a</sup>	S <sup>b</sup>	T <sup>c</sup>	Response <sup>d</sup>
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

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

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

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

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

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