Electronic Supplementary Information

AN-ART-10-2015-002059

Zeolitic imidazole framework templated synthesis of nanoporous carbon as a novel fiber coating for solid-phase microextraction

Shuaihua Zhang, Qian Yang, Zhi Li, Wenchang Wang, Chun Wang, Zhi Wang*

Department of Chemistry, College of Science, Agricultural University of Hebei, Baoding 071001, China

* Corresponding author: Zhi Wang

Phone: +86-312-7521513

Fax: +86-312-7521513

E-mail: wangzhi@hebau.edu.cn; zhiwang2013@aliyun.com

Effect of Co-NPC coating thickness on the extraction performances

Generally, the fiber coatings with higher thickness will enhance the adsorptive capacity for analytes, but a longer equilibrium time is required.[1] To investigate the effect of the Co-NPC coating thickness on the extraction performances, the extraction efficiencies of the Co-NPC coating with different thicknesses for the OCPs were evaluated. The thickness of the Co-NPC coating was measured by SEM, and the respective average thicknesses of the fibers with one to five coating cycles were 15, 32, 45, 60 and 73 μm, respevtively. Fig. S1 shows that the peak areas of the five OCPs were increased with increased coating thickness from 15 μm to 60 μm and then became almost unchanged. Thus, a coating thickness of 60 μm was adopted for the experiments.

1. B. T. Zhang, H. F. Li, X. Zheng, Y. Teng, Y. Liu and J. M. Lin, *J. Chromatogr. A*, 2014, **1370**, 9-16.

Supplement of Figures

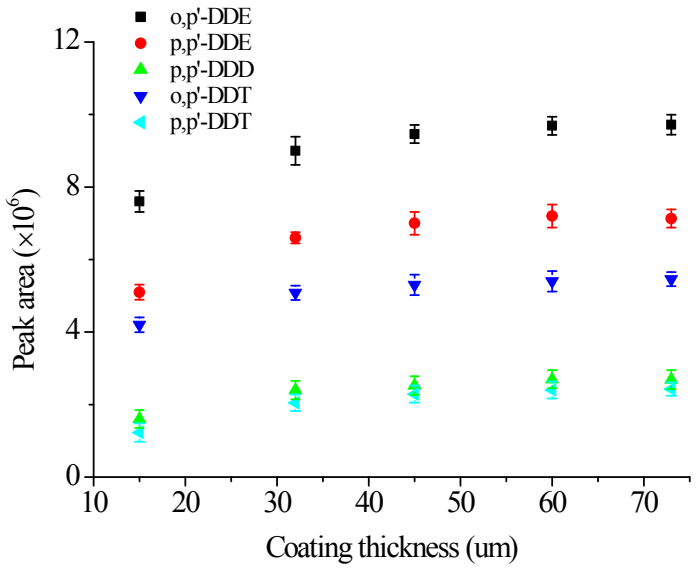


Fig. S1 Effect of Co-NPC coating thickness on the extraction performances.

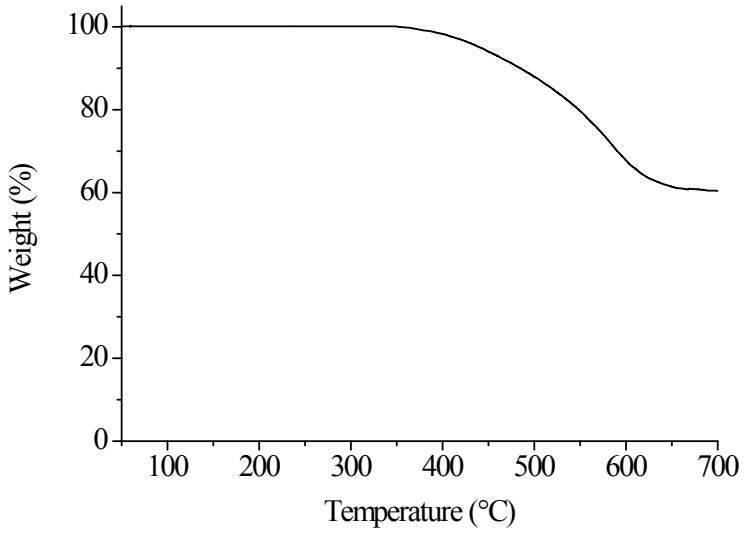


Fig. S2 Thermogravimetric curve of the Co-NPC fiber coating.

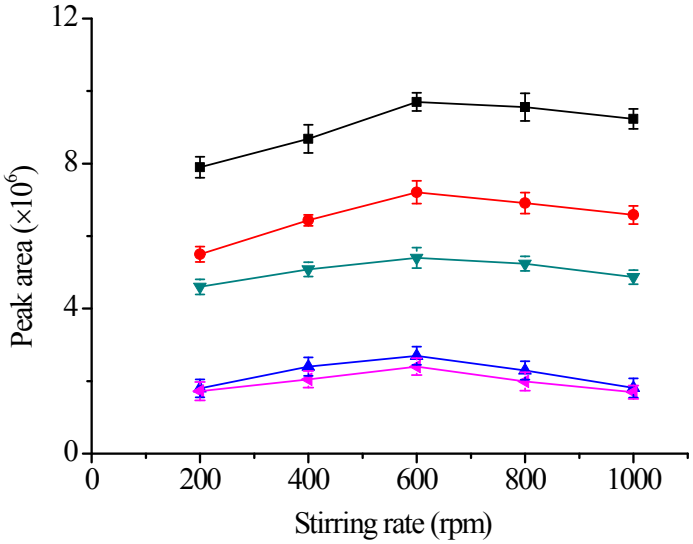
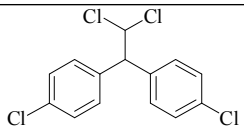
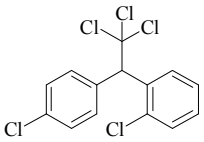
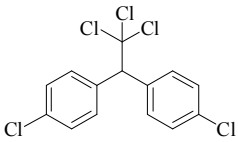
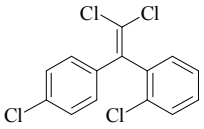
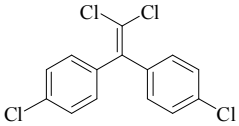
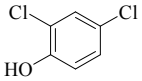
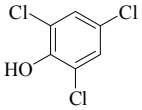
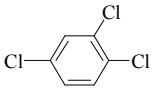
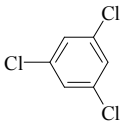
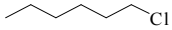
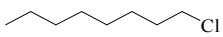


Fig. S3 Effect of stirring rate. *Conditions*: analyte concentration, 100 ng L^{-1}; extraction temperature, room temperature; extraction time, 30 min; KCl concentration, 15% (*w/v*); desorption, at 260 °C for the whole run time.

Supplement of Tables

Table S1 Physical-Chemical properties of different analytes and their enrichment factors (EFs) on the Co-NPC coated fiber

Analyte	Structure	Molecular weight	Boiling point (°C)	log*P* [a]	EFs
p,p'-DDD		320.04	398.9	5.39	2811± 169
o,p'-DDT		354.49	409.6	5.92	3029± 112
p,p'-DDT		354.49	416.2	5.92	3236± 130
o,p'-DDE		318.03	380.6	6.22	4311± 236
p,p'-DDE		318.03	383.1	6.37	4569± 182
2,4-dichlorophenol		163.00	210.0	2.99	623± 25
2,4,6-trichlorophenol		197.45	246.0	3.58	741± 29
1,2,4-Trichlorobenzene		181.45	211.4	3.82	933± 36
1,3,5-Trichlorobenzene		181.45	211.3	4.04	976± 41
1-chlorohexane		120.62	133.9	3.63	79± 2.4
1-chlorooctane		148.67	181.9	4.69	146± 5.1

[a]*n*-octanol/water partition coefficients, indicator for hydrophobicity. Data taken from RSC Publishing Home: http://www.chemspider.com

Conditions: analyte concentration, 100 ng L^{-1}; extraction temperature, 25 °C; extraction time, 30 min; KCl concentration, 15% (*w/v*); stirring rate, 600 rpm; desorption, at 260 °C for the whole run time.

Table S2 Comparison with other reported relevant methods for the SPME of organochlorine pesticides in different samples.

Instrumentation	Fiber coating[a]	Samples	Linear range	LOD	RSD (%)	Refs
GC/ ECD	PDMS	bird livers	5-500 ng g^{-1}	0.5-1.0 ng g^{-1}	4.8-13.4	52
GC/ MS	PDMS	textiles	1-500.0 ng mL^{-1}	0.04-0.41 ng mL^{-1}	3.2-11.3	53
GC/ ECD	PMPS	celery cabbage, garlic and cabbage	0.5-100 ng g^{-1}	0.23-1.45 ng g^{-1}	7.6-16.7	54
GC/ ECD	PDMS	estuarine sediments	0.01-53 ng g^{-1}	0.01-0.26 ng g^{-1}	6-18	55
GC/ μECD	PDMS-DVB	agricultural soils	0.5-100 ng g^{-1}	0.014-1.2 ng g^{-1}	1.3-4.2	56
GC/ μECD	Co-NPC	cabbage, cucumber and celery cabbage	0.30-50 ng g^{-1}	0.07-0.45 ng g^{-1}	4.9-9.6	This method

[a] PDMS, polydimethylsiloxane; PMPS: polymethylphenylsiloxane; PDMS-DVB,polydimethylsiloxane/ divinylbenzene.

References

52. D. A. Lambropoulou, I. K. Konstantinou and T. A. Albanis, *Anal. Chim. Acta*, 2006, **573-574**, 223-230.

53. J. A. Cai, F. Zhu, W. Ruan, L. Liu, R. Lai, F. Zeng and G. Ouyang, *Microchem. J.*, 2013, **110**, 280-284.

54. J. Zeng, J. Chen, Z. Lin, W. Chen, X. Chen and X. Wang, *Anal. Chim. Acta*, 2008, **619**, 59-66.

55. P. N. Carvalho, P. N. Rodrigues, F. Alves, R. Evangelista, M. C. Basto and M. T. Vasconcelos, *Talanta*, 2008, **76**, 1124-1129.

56. M. Fernandez-Alvarez, M. Llompart, J. P. Lamas, M. Lores, C. Garcia-Jares, R. Cela and T. Dagnac, *J. Chromatogr. A*, 2008, **1188**, 154-163.