

Triphenylamine-functionalized magnetic microparticles as a
new adsorbent coupled with high performance liquid
chromatography for the analysis of trace polycyclic aromatic
hydrocarbons in aqueous samples

Yiming Long, Yingzhuang Chen, Fei Yang, Chunyan Chen, Di Pan,
Qingyun Cai*, Shouzhuo Yao*

Supplementary Materials

2. Experimental

2.6 HPLC-FLD analysis

Table S-1 Optimized fluorescent detection program used for PAHs determination

Time(min)	Excitation(nm)	Emission(nm)	PAH determined
0.0-14.0	250	400	Ant
14.0-16.2	280	460	FIA
16.2-24.0	273	390	Pyr, Chr
24.0-32.0	294	430	BbF, BkF

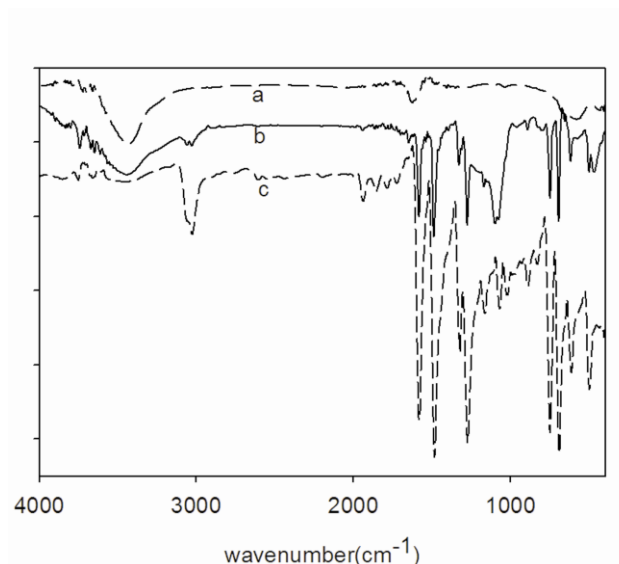
* Corresponding authors. E-mail: *qyc ai0001@hnu.edu.cn*; Fax: 0731-88821848

* Corresponding authors. E-mail: *szyao@hnu.edu.cn*; Fax: +86-731-88821848

3. Results and discussion

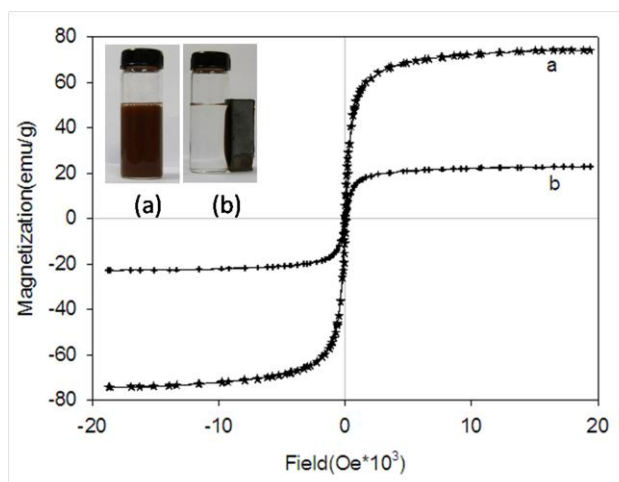
3.1 Characterization of prepared products

Figure S-1 FTIR spectroscopy of Fe_3O_4 (a), $\text{Fe}_3\text{O}_4/\text{SiO}_2/\text{TPA}$ composite microspheres (b), and TPA (c).



3.2 Magnetic properties of prepared products

Figure S-2 Magnetization curves of Fe_3O_4 nanoparticles (a) and $\text{Fe}_3\text{O}_4/\text{SiO}_2/\text{TPA}$ composite (b). Inset shows the photographs of the dispersion (1) and separation (2) process of $\text{Fe}_3\text{O}_4/\text{SiO}_2/\text{TPA}$ composite.



3.4 Analytical method validation

Table S-2 Comparative data of the represented method with C-18 SPE cartridge (n = 5)

Analyte	Spiked ($\mu\text{g/L}$)	Recovery (%)		RSD (%)	
		Present study	C-18	Present study	C-18
Ant	0.10	90.01	93.82	4.52	2.55
FlA	0.20	87.87	94.36	2.86	3.10
Pyr	0.20	85.67	89.58	1.15	2.96
Chr	1.50	100.58	86.41	3.98	1.72
BbF	0.08	103.02	89.70	1.83	4.75
BkF	0.02	101.80	90.63	2.69	3.05

3.5 Application to real water samples

Table S-3 Analytical results of the proposed MSPE method for the determination of PAHs in real water samples (n = 5)

Analyte	Spring water		Tap water		River water	
	Detected	RSD	Detected	RSD	Detected	RSD
	concentrations	(%)	concentrations	(%)	concentrations	(%)
	(ng/L)		(ng/L)		(ng/L)	
Ant	n.d. ^{a)}	-	n.d.	-	2.47	2.73
FlA	n.d.	-	n.d.	-	n.d.	-
Pyr	n.d.	-	n.d.	-	n.d.	-
Chr	n.d.	-	n.d.	-	n.d.	-
BbF	n.d.	-	n.d.	-	n.d.	-
BkF	n.d.	-	n.d.	-	0.38	3.92

a) Not detected

Table S-4 Comparative data of the represented method with other methods in literatures

	Present study	Ref. ¹⁸	Ref. ³¹	Ref. ³²	Ref. ³³	Ref. ³⁴
Pretreatment method	MSPE	MSPE	C30-SPE ^{a)}	SPME ^{b)}	SBSE ^{c)}	MWCNTs ^{d)}
Analytical method	HPLC-FLD	GC-MS	GC-MS	GC-MS	HPLC-FID	GC-MS
LODs (ng/L)	0.04-3.8	14.1-70.0	30.0-210.0	0.32-2.2	0.2-1.5	2.0-5.3
Recoveries (%)	82.5-104.7	83.6-119.1	79.0-115.0	78.8-100.7	60.1-86.8	74.5-105.0

a) C30 solid phase extraction

b) Solid phase microextraction

c) Stir bar sorptive extraction

d) Multi-walled carbon nanotubes