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ARTICLE TYPE

# Magnetic retrieval of extractant: Fast ultrasound-assisted emulsification liquid-liquid microextraction for the determination of polycyclic aromatic hydrocarbons in environmental water samples

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## Supplementary Information

### 1. Experimental

Table S1 Excitation and emission wavelength program used for the fluorescence detection of PAHs.

PAHs	Time (min)	Excitation (nm)	Emission (nm)
Flu	0	260	340
Ant	12	250	370
FIA	15	289	462
BaA	21	266	403
BbF, BkF	25	294	430

### 2. Results and discussion

#### 2.1 Characterization of HMPs

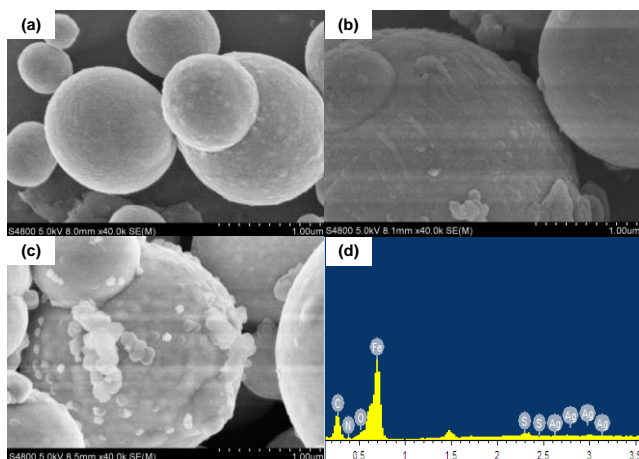


Fig. S1. FESEM images of (a) pristine carbonyl iron particles, (b) Fe-PD particles, and (c) Fe-PD/Ag particles. EDX spectrum of resultant HMPs (d).

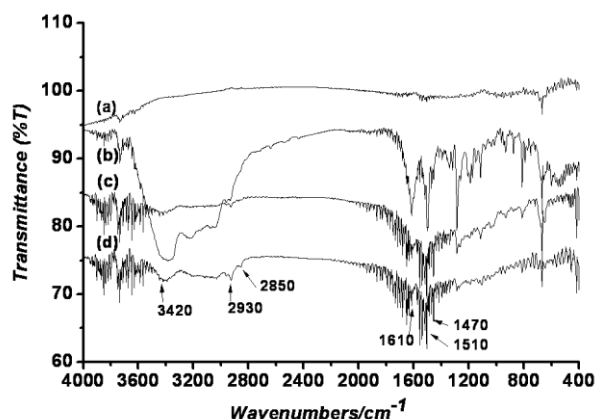


Fig. S2. FTIR spectra of (a) pristine carbonyl iron particles, (b) dopamine, (c) Fe-PD particles, and (d) resultant HMPs.

The specific surface area of the resultant HMPs was studied using Brurauer Emmerr Teller (BET) Procedure, giving a BET surface area of 1.234m<sup>2</sup>/g. The BET surface area is relatively small, which might be attributed to the solid structure and relative large diameter of the particles.

#### 2.2 Extraction optimization and comparison of two-step USAEME-MR with direct MSPE

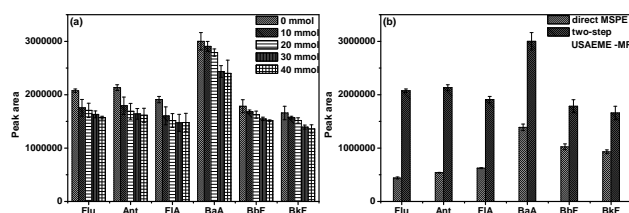
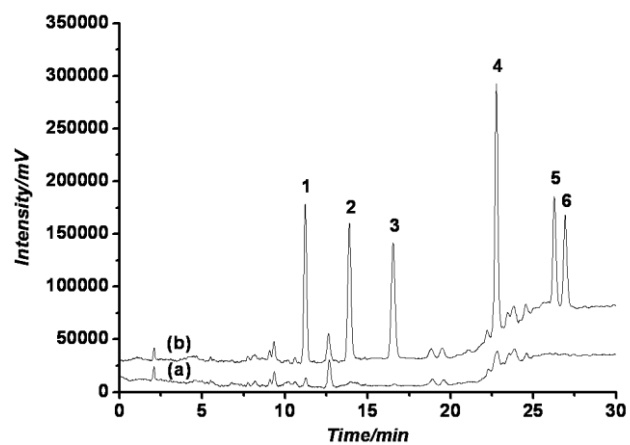


Fig. S3. (a) Effect of salt addition and (b) comparison of the extraction efficiencies of the two-step USAEME-MR with the direct MSPE. Composition of the aqueous solution: Flu (2.5 μg L<sup>-1</sup>), Ant (5 μg L<sup>-1</sup>), FIA (10 μg L<sup>-1</sup>), BaA (2.5 μg L<sup>-1</sup>), BbF (2.5 μg L<sup>-1</sup>), and BkF (0.5 μg L<sup>-1</sup>); sample volume: 20 mL; organic extractant: 1-octanol; volume of organic extractant: 15 μL; emulsification time: 4 min; vortex time: 4 min; desorption solvent: acetonitrile; desorption time: 4 min.

#### 2.3 Application to real samples



**Fig. S4.** HPLC chromatograms of PAHs in unspiked (a) and spiked (b) water samples from Xiangjiang river: (1) Flu; (2) Ant; (3) FIA; (4) BaA; (5) BbF; (6) BkF. Spiked concentration: Flu ( $2.5 \mu\text{g L}^{-1}$ ), Ant ( $5 \mu\text{g L}^{-1}$ ), FIA ( $10 \mu\text{g L}^{-1}$ ), BaA ( $2.5 \mu\text{g L}^{-1}$ ), BbF ( $2.5 \mu\text{g L}^{-1}$ ), and BkF ( $0.5 \mu\text{g L}^{-1}$ ).