Electronic Supplementary Material (ESI) for Analytical Methods.

Core-shell nano-sized magnetic molecularly imprinted solid phase extractant coupled with HPLC for the selective isolation and determination of 17β-estradiol in lake water sample

Ruixia Gao[a]*, Yi Hao[a,b], Lili Zhang[a,b], Xihui Cui[a,b], Dechun Liu[c], Yuhai Tang[a,b]*

[a] *Institute of Analytical Science, School of Science, Xi'an Jiaotong University, Xi'an 710049, China.*

[b] *College of Pharmacy, Xi'an Jiaotong University, Xi'an 710061, China.*

[c] *Department of Hepatobiliary Surgery, First Hospital of Xi'an Jiaotong University*

* Corresponding authors: Tel.: +86 29 82655399; fax: +86 29 82655399.

E-mail: ruixiagao@mail.xjtu.edu.cn (R. Gao); tyh57@mail.xjtu.edu.cn (Y. Tang).

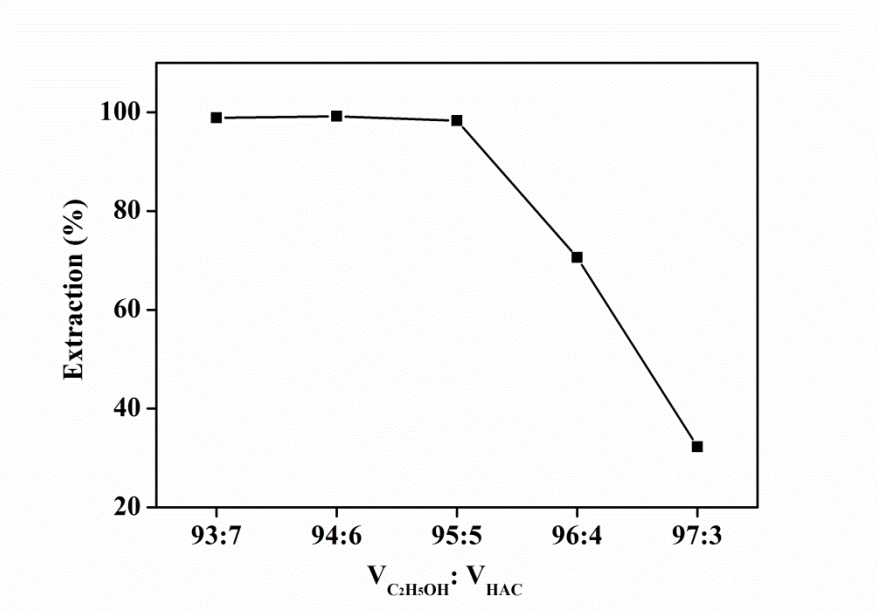

Fig. S1. Effect of volume ratio of ethanol to HAc in elution solvent.

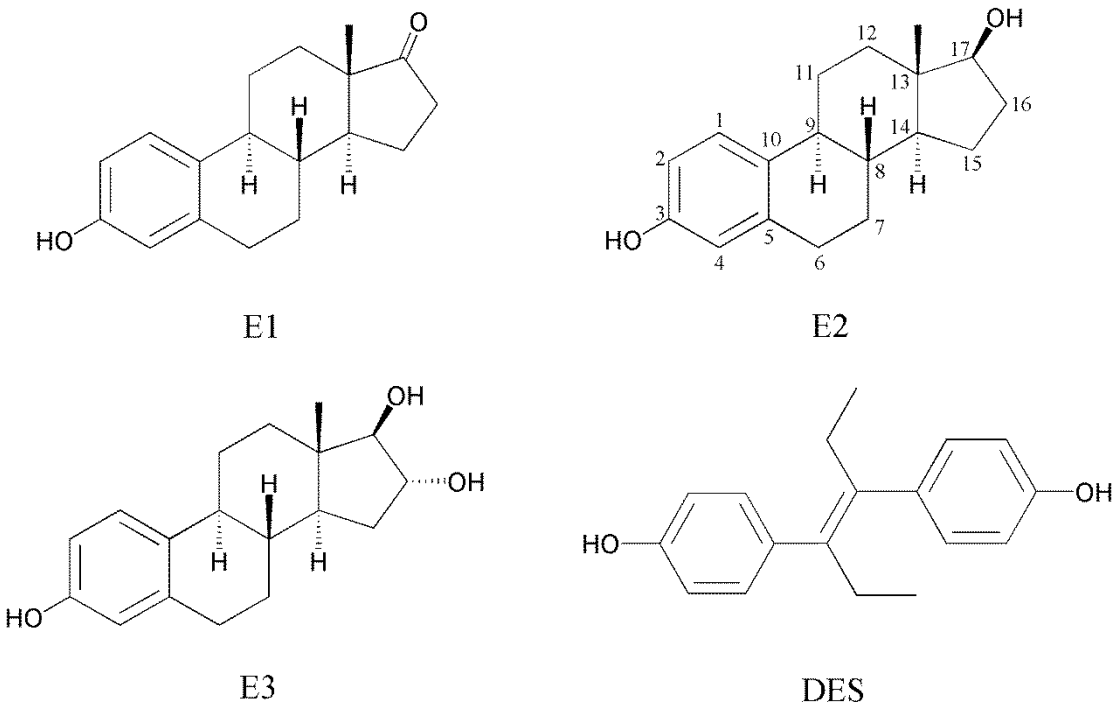

Fig. S2. Molecular structures of estrogens used in this study.

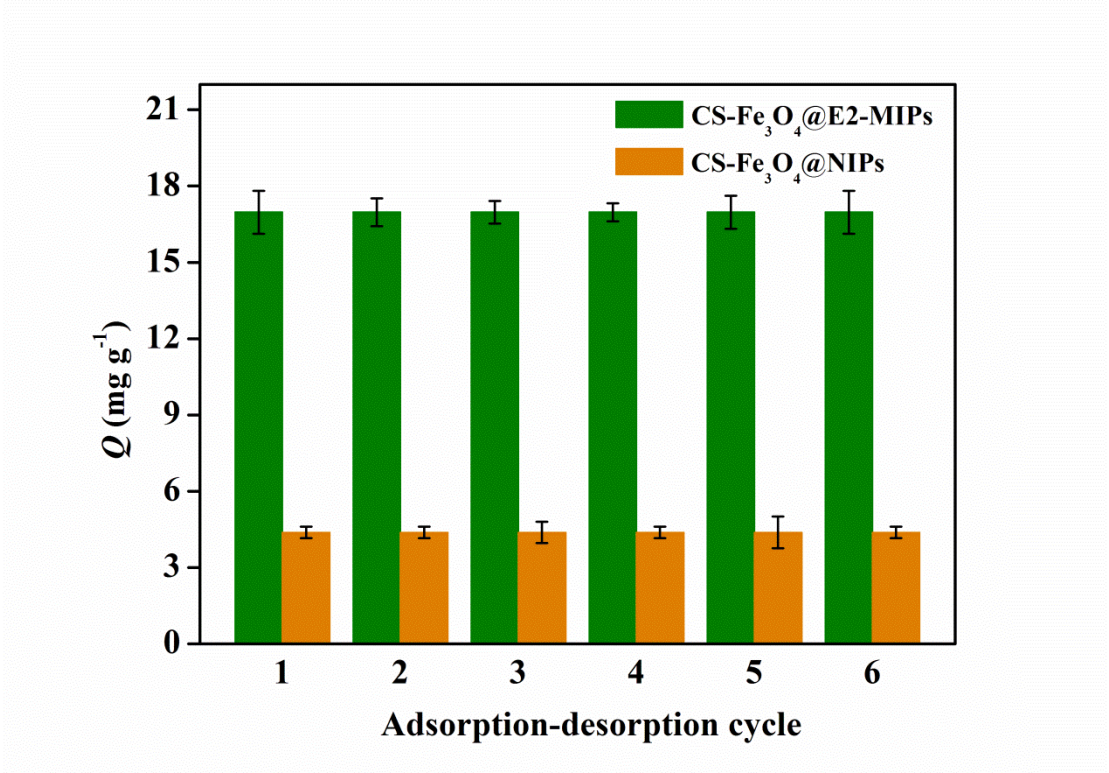

Fig. S3. Reusability of CS-Fe_3O_4@E2-MIPs and CS-Fe_3O_4@NIPs.

Table S1

Reproducibility of CS-Fe_3O_4@E2-MIPs and CS-Fe_3O_4@NIPs.

Polymers	Batch	1	2	3	4	5	6	Average
CS-Fe_3O_4@E2-MIPs	Q (mg g^{-1})	16.42	16.32	16.39	16.45	16.37	16.30	16.38
	RSD	3.7	8.0	6.7	5.7	5.8	8.9	6.5
CS-Fe_3O_4@NIPs	Q (mg g^{-1})	4.382	4.362	4.322	4.362	4.380	4.342	4.358
	RSD	3.2	5.1	9.4	5.4	3.6	7.6	5.7

Table S2

Recoveries of CS-Fe_3O_4@E2-MIPs binding E2 for spiked lake water samples (n=5).

Lake water	E2					
	1.0 ng mL^{-1}		10.0 ng mL^{-1}		100.0 ng mL^{-1}	
	Recovery (%)	RSD (%)	Recovery (%)	RSD (%)	Recovery (%)	RSD (%)
Intra-day	94.2	4.3	96.7	3.7	98.3	3.2
Inter-day	95.1	5.8	96.2	4.2	97.9	3.9

C_{18}-SPE method was used to pretreat the spiked lake water sample, and the chromatogram was compared with MIP-SPE method developed in this work as shown in Fig. S3. It is obvious that there is no peak corresponding to other impurities in the chromatogram of spiked lake water which was pretreated by MIP-SPE (Fig. S4A). However, after being treated by C_{18}-SPE, the peak height of E2 was lower and some other peaks of impurities appeared in the chromatogram (Fig. S4B). The results confirm that CS-Fe_3O_4@E2-MIPs has good adsorption capacity and selectivity to E2.

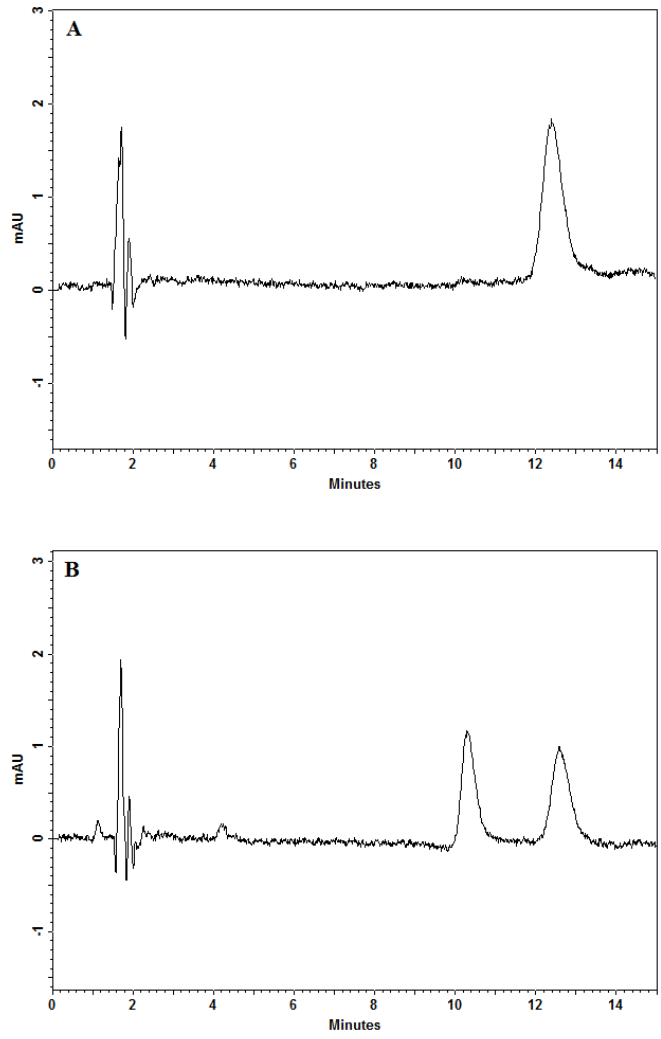

Fig. S4. Chromatograms of elution of absorbed CS-Fe_3O_4@E2-MIPs (A), and C_{18}-SPE (B).

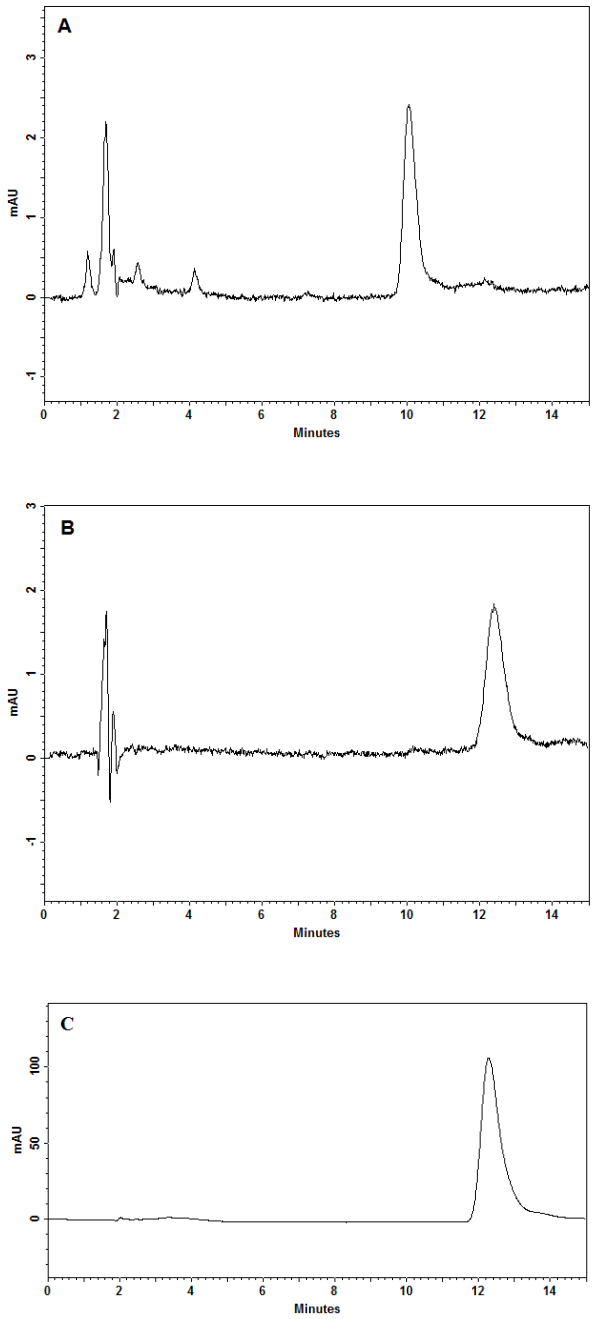

Fig. S5. Chromatograms of lake water sample spiked with E2 at the concentration of 100.0 ng mL^{-1}(A), elution of absorbed CS-Fe_3O_4@E2-MIPs (B), and E2 standard sample (C).