

## Supporting Information

### **A label-free detection of diethylstilbestrol based on surface-graft molecularly imprinted polymers-coated upconversion nanoparticles**

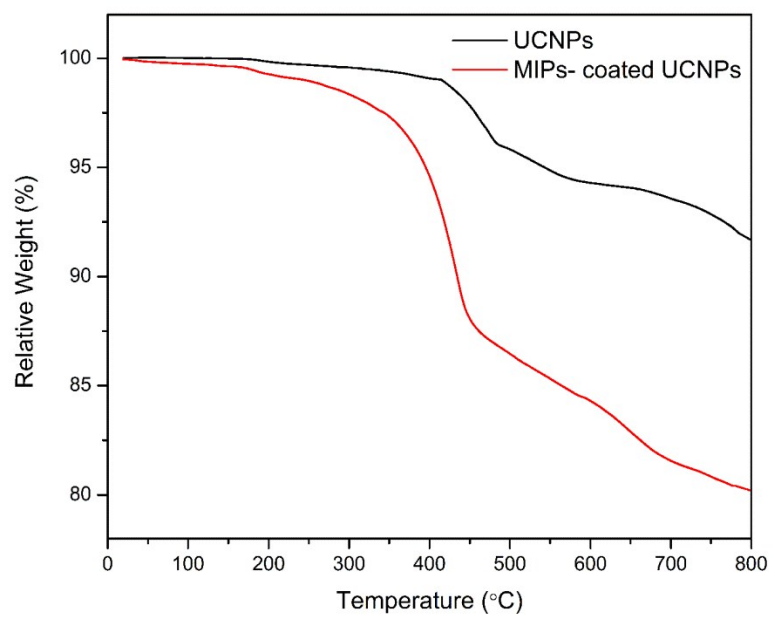
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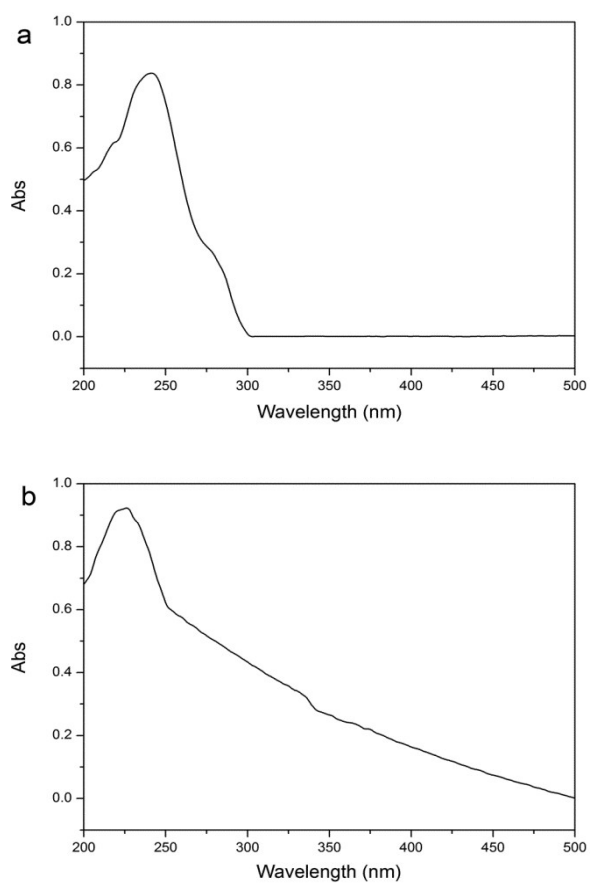
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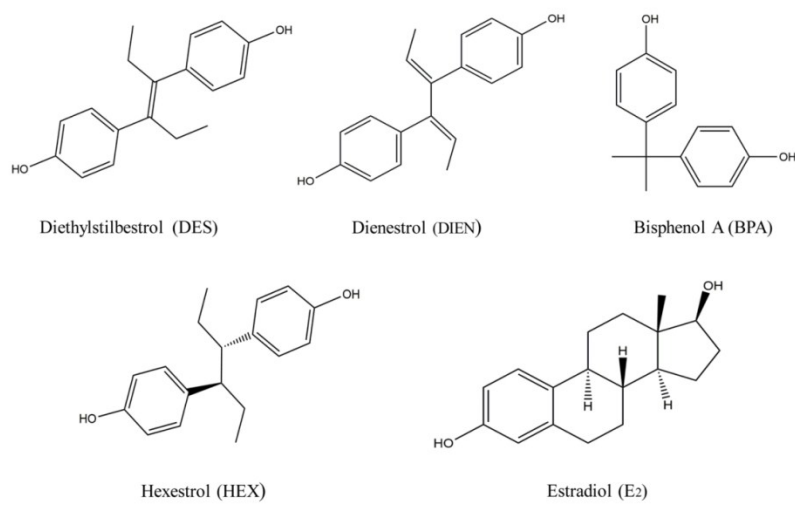
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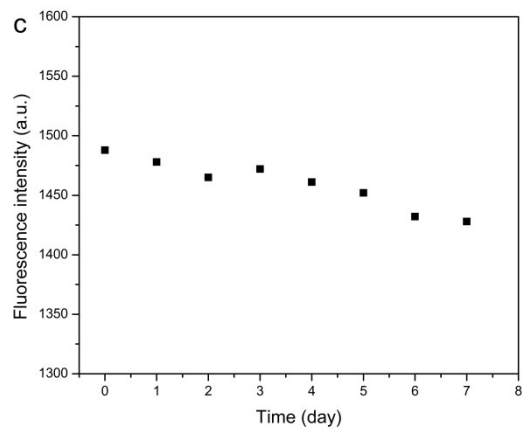
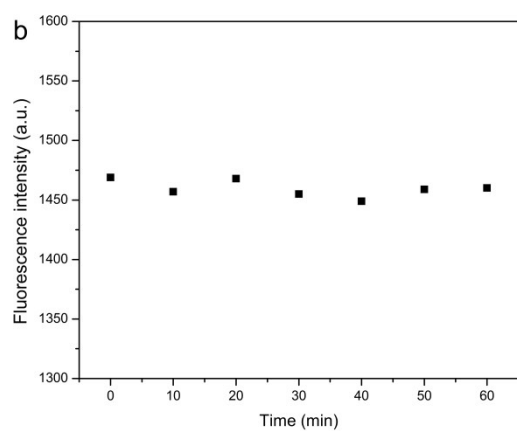
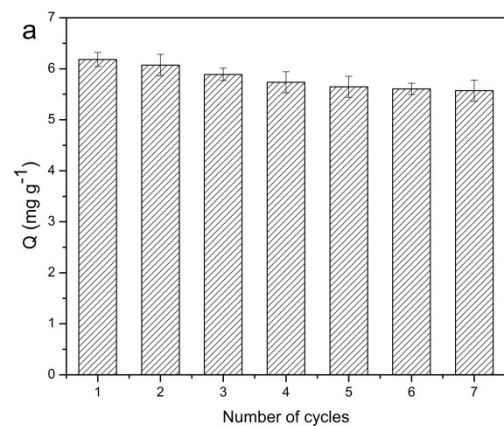
**Fig. S1†.** TGA curves of UCNPs and MIPs-coated UCNPs.



**Fig. S2†.** The UV absorption spectra of DES (a) and UCNPs (b) in acetonitrile.



**Fig. S3†.** Chemical structures of five analogues.



**Fig. S4†.** (a) Reusability of MIPs-coated UCNPs for DES adsorption, (b) Fluorescence intensity of 0.5 mg mL<sup>-1</sup> MIPs-coated UCNPs solution within 60 min. (c) Fluorescence intensity change of MIPs-coated UCNPs solution within 7 days.

**Table S1†**

The effects of identification of the peak of the IR spectra

Categories	Wavenumber (cm-1)	Functional group	Meaning
a	1703	C=O	the oleic acid molecule
	2926,2856	-CH <sub>2</sub> -	
	1090, 808, 942	Si-O	the silica shell
b	1716	C=O	MPS
	1636	C=C	
	2925	-CH <sub>2</sub> -	EGDMA
c	2955	CH <sub>3</sub> -	
	1722	C=O	a layer of MIP shell
	1163	C-O-C	

**Table S2†**

Comparison between this method and other methods in literatures.

Methods	Linear range (ng ml <sup>-1</sup> )	LODs (ng ml <sup>-1</sup> )	Repeatability	Measure process	Ref.
MIFSNCs	100-700	-	No	Complex	[34]
NIR FL probe Cy-DES	268-2147	53.7	-	Complex	[35]
MIP-HFT	7.5-200	2.5	-	Complex	[36]
Bi <sub>2</sub> WO <sub>6</sub> -CPE	13-616	4.1	No	Complex	[37]
CCBPE	4.2-125	2.2	No	Complex	[38]
GCE	536.7-26836	21.5	No	Complex	[39]
MIP-coated UCNPs	50-1000	12.8	Yes	Simple	This work

## References

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