Supporting Information

Ultrasensitive electrochemiluminescence aptasensor for the detection of diethylstilbestrol based on an enhancing mechanism of the metal-organic frameworks NH_2-MIL-125 (Ti) in 3, 4, 9, 10-perylenetetracar-boxylic acid/$K_2S_2O_8$ system

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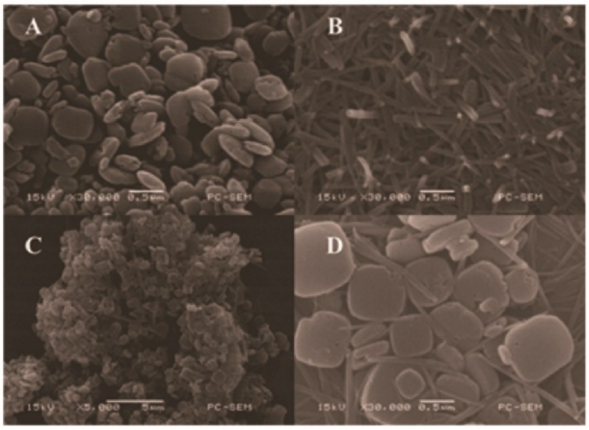

Figure S1. SEM images of (A) NH_2-MIL-125, (B) PTCA and (C, D) PTCA/NH_2-MIL-125.

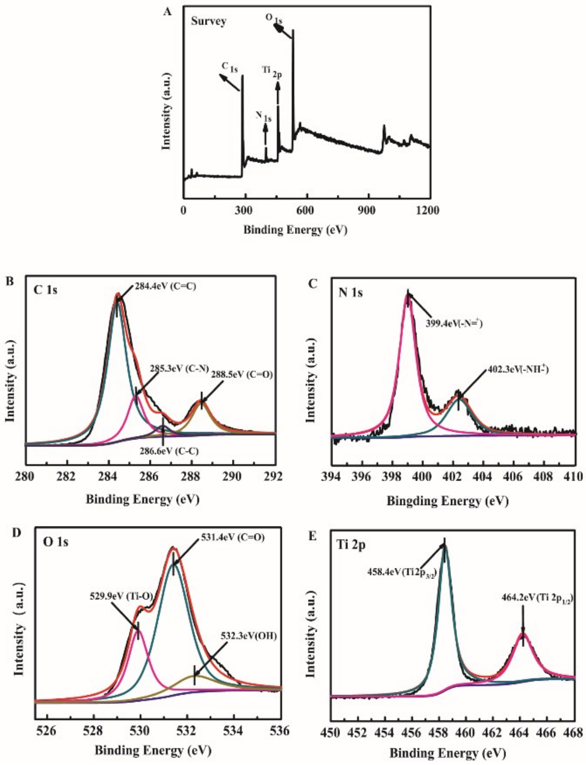

Figure S2. XPS spectra of PTCA/NH_2-MIL-125 sample (A) Survey of the sample, (B) C 1s, (C) N1s, (D) O 1s, (E) Ti 2p.

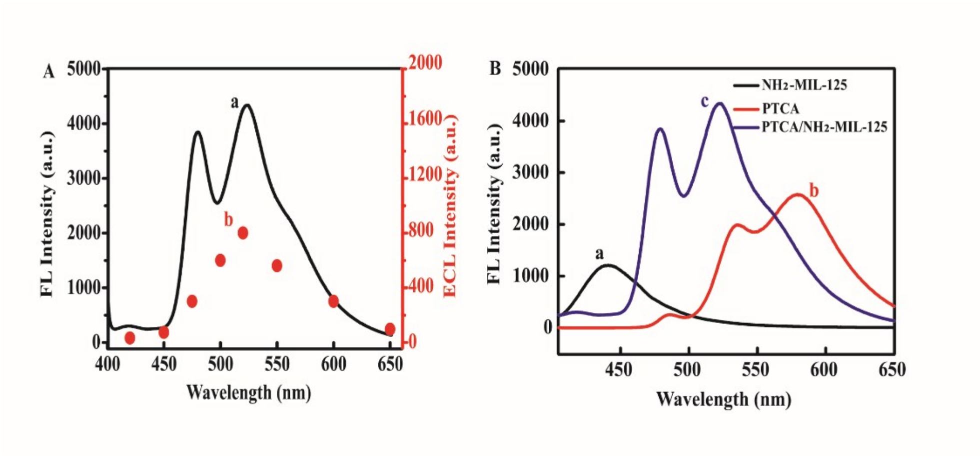

Figure S3. (A) (a) Fluorescence spectra and (b) electrochemical luminescence emission spectra of NH_2-MIL-125/PTCA; (B) Fluorescence spectra of (a) NH_2-MIL-125, (b) PTCA and (c) NH_2-MIL-125/PTCA.

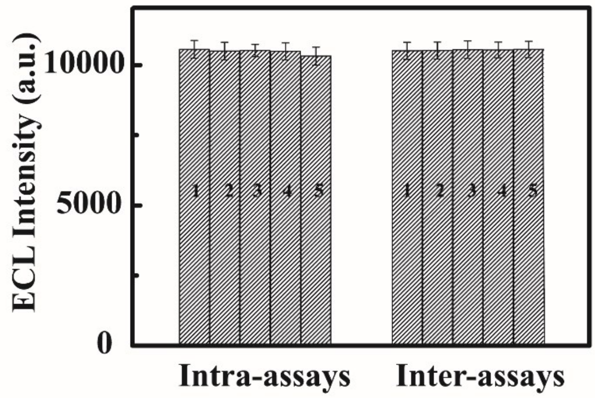

Figure S4. Reproducibility of the ECL aptasensor in 0.1nm of DES.

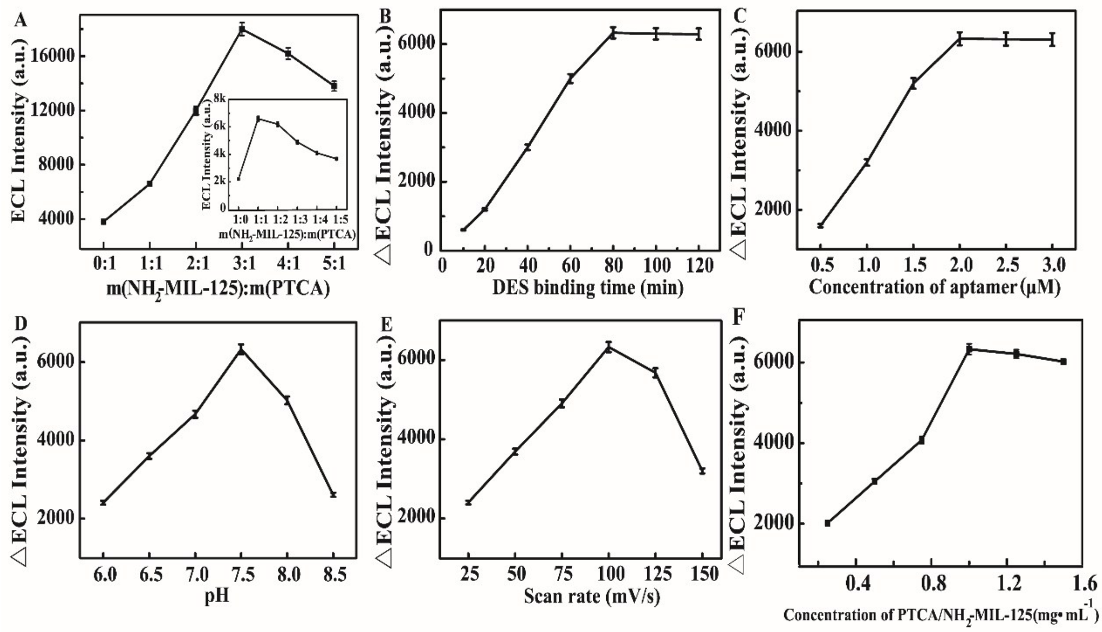

Figure S5. Effects of (A) the mass ratio of NH_2-MIL-125 and PTCA; (B) the reaction time between the amino-aptamer with DES; (C) concentration of aptamer; (D) buffer pH; (E) scan rate on the ECL intensity of the as-fabricated ECL aptasensor; (F) concentration of PTCA/NH_2-MIL-125;

Table S1. Comparison of different analytical methods for DES

Method	Linear range	LOD	Reference
MIP	7.45×10^{-10}~3.73×10^{-6}M	2.2×10^{-11}M	1
DPV	1.0×10^{-8}~ 1.3×10^{-5} M	4×10^{-9} M	2
CV	2.0×10^{-5}~1.0×10^{-7} M	1.5×10^{-8}M	3
Electrochemical immunosensor	1.86×10^{-11}~1.86×10^{-9} M	6.98×10^{-12}M	4
ECL(MMIPs - QDs-Aptamer)	0.3~1.0×10^{5}pg•mL^{-1}	0.1pg•mL^{-1}	5
ECL($Ru(bpy)_3^{2+}$/ UiO-67)	0.01ng•mL^{-1}~50pg•mL^{-1}	3.27fg•mL^{-1}	6
ECL(CdTe@ZnS/ r-GO)	1.8×10^{-3}~25.0nM	0.25pM	7
ECL(apt/PTCA/ NH_2-MIL-125)	1.0×10^{-15}~ 1.0×10^{-6}M	2.8×10^{-16}M	This work

Table S2. Application of the ECL aptasensor for DES determination in real samples

Sample	Added value fM	Found amount fM	Recovery (%)	RSD (%) (n=3)
Tap water	0	ND	-	-
	20.00	21.08	105.4	5.3
	50.00	48.16	96.3	3.8
	100.00	103.32	103.3	4.0
Lake water	0	ND	-	-
	20.00	19.22	96.1	4.0
	50.00	49.16	98.3	1.7
	100.00	104.00	104.0	3.8
Pond water	0	ND	-	-
	20.00	19.60	98.0	4.2
	50.00	48.22	96.4	3.6
	100.00	102.20	102.2	2.9

ND=not founded

References

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