Supporting Information

Highly Sensitive and Selective Detection of PCB 77 Using an Aptamer-Catalytic Hairpin Assembly in an Aquatic Environment

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1. Gel Electrophoresis Assay

Gel electrophoresis analysis was performed using 12% (w/w) denatured polyacrylamide gel electrophoresis (PAGE) gels in 1 × TAE buffer. The electrophoresis was then performed at a constant potential of 250 V for 20 min with a load of 10 μL of sample in each lane at room temperature. After electrophoresis imaged via a Bio-Rad Gel.Doc 2000 imaging system.

Fig. S1 12% denatured PAGE gel for aptamer-CHA amplification reaction. Lane M: DNA marker; Lane 1: aptamer+ H1 + H2 in buffer without PCB 77; Lane 2: aptamer+ H1 + H2 in buffer with PCB 77 (20 μg/L).

2. Optimization Assay

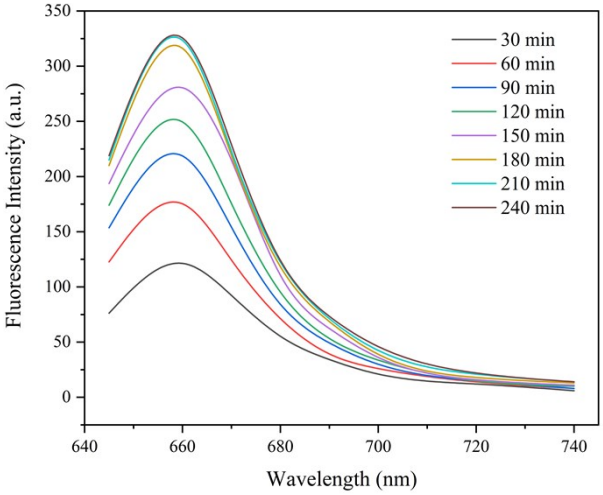

Fig. S2 Fluorescence spectra of aptamer-CHA reaction time.

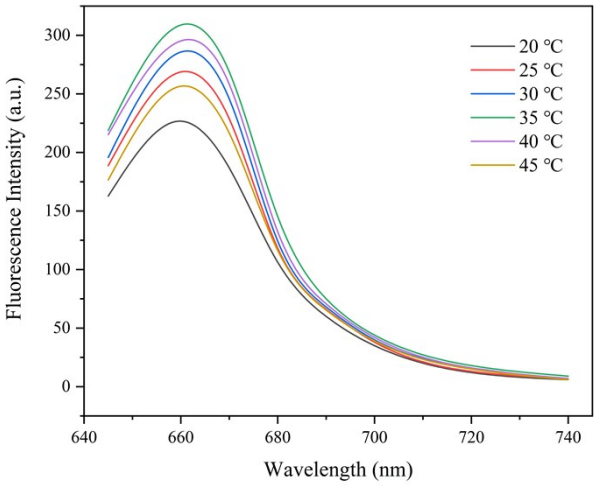

Fig. S3 Fluorescence spectra of aptamer-CHA reaction temperature.

3. Selectivity of the Aptamer-CHA Assay

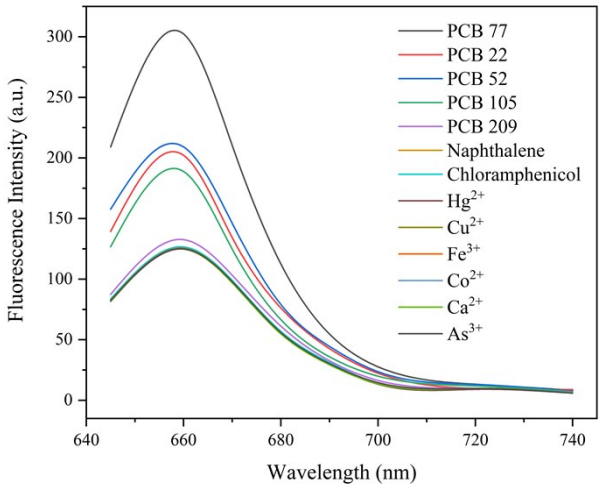

Fig. S4 Fluorescence spectra for the selectivity of the aptamer-CHA reaction.

4. Reproducibility, Repeatability and Long-term Stability

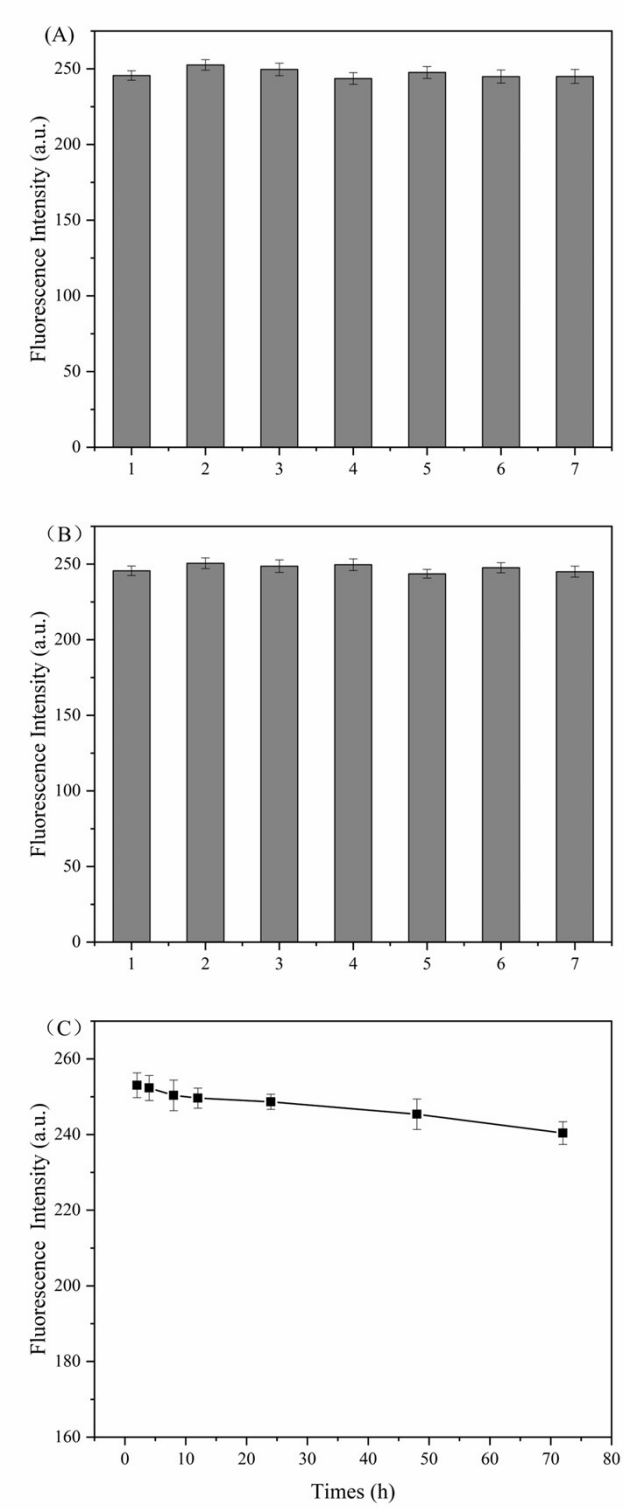

Fig. S5 Reproducibility, repeatability and long-term stability of the aptamer-CHA reaction. The dose of PCB 77 was 20 μg/L. (A) Seven aptamer-CHA reaction prepared under the same conditions to detect the same PCB 77. (B) Seven PCB 77 prepared under the same conditions were measured by the same aptamer-CHA reaction. (C) The same aptamer-CHA reaction was measured PCB 77 three times at different times (2, 4, 8, 12, 24, 36, 72 h).

5. Water Sample Analysis

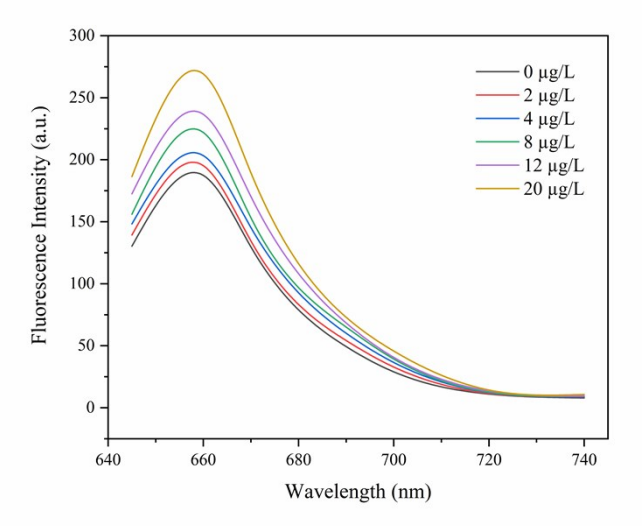

Fig. S6 Fluorescence spectra for the water sample analysis.

Table S1. Detection data of PCB 77 in an actual water sample.

Added amount of PCB 77 (μg/L)	Average ± SD (μg/L)	Recovery (%)	RSD (%)
0	2.14 ± 0.08	70.00	3.90
2	4.12 ± 0.16	81.52	3.95
4	6.30 ± 0.19	89.32	3.05
8	11.34 ± 0.57	102.57	5.02
12	15.30 ± 0.64	101.62	4.21
20	24.09 ± 1.24	104.49	5.14