

Supporting Information

In₂O₃/AgBiS₂ heterojunction – gated organic photoelectrochemical transistor with DNAzyme-mediated reaction for sensitive detection of bisphenol A

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Materials and Apparatus.

Materials: In(NO₃)₃·4H₂O, NH₃·H₂O, AgNO₃, N,N-Dimethylformamide, citric acid, BiCl₃, ethanol were purchased from Macklin (Shanghai, China). Poly (3, 4-ethylenedioxythiophene)-poly (styrene sulfonate) (PEDOT: PSS, Clevios PH1000) was purchased from Heraeus. Ascorbic acid (AA), Phosphate buffered solutions (PBS) was purchased from G-Clone (Beijing) Biotechnology Co. Acrylamide Gel, ethidium bromide, N, N, N', N'-Tetramethyl ethylenediamine and All oligonucleotides were synthesized by Shanghai Sangong Biotechnology Co. All reagents are analytical grade and are used without further purification. All aqueous solutions were prepared from ultrapure water (Millipore, 18 MΩ cm).

H1(CCGGTGGGTGGAATCAGGGAGGGCGGGTGGGTCACGTGTTGTCTCTCTTAACC),

H2(CCACCGACCGGTGGGTGGGCGGGAGGGACTGGTTAAACAGAGAGACAACACGTG),

cDNA(NH₂-TTTTTTTTCCACCGAGCCGGTCGAACCCACCGG),

Apt(CCGGTGGGTGGAA)

Apparatus: The crystal structure, morphological structure and elemental composition were analyzed by transmission electron microscope (TEM, JEM-2100PLUS, Japan), X-ray photoelectron spectroscopy (XPS, ESCALAB XI+, China). The PEC measurements were carried out with a three electrode-based electrochemical workstation (CHI 660E, Chenhua Instruments Co. Ltd., Shanghai). The OPECT currents are collected by the CHI 1232 electrochemical workstation (Nandaguang, Nanjing, China).

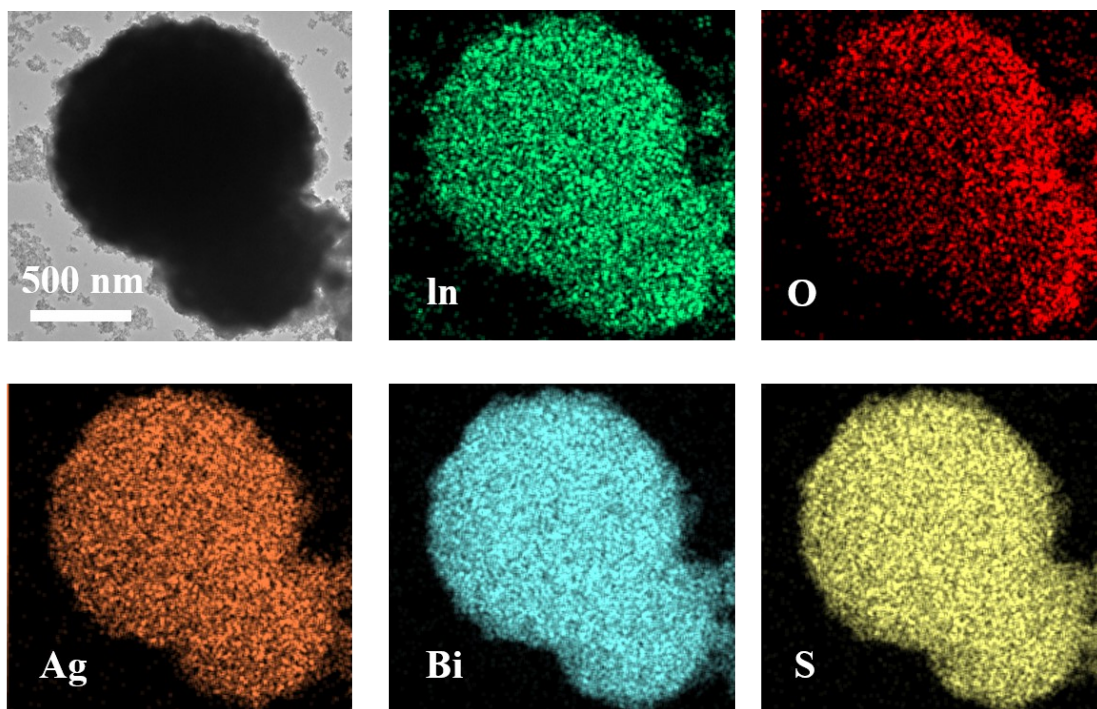


Figure S1 The transmission electron microscopy (TEM) image and elemental mapping images of the In₂O₃/AgBiS₂ heterojunction nanomaterials.

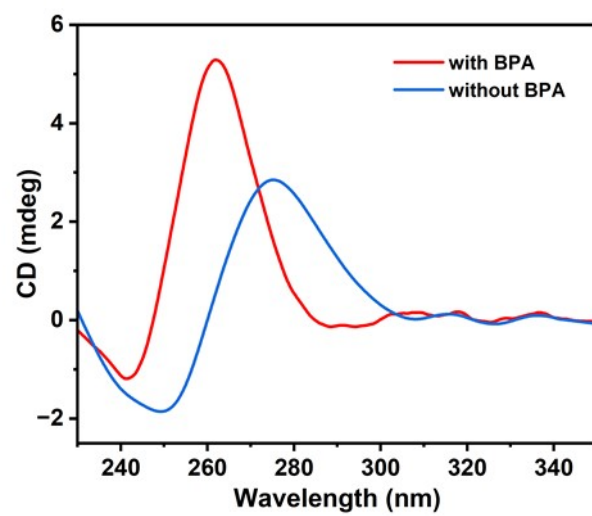


Figure S2 Circular dichroism spectroscopy.

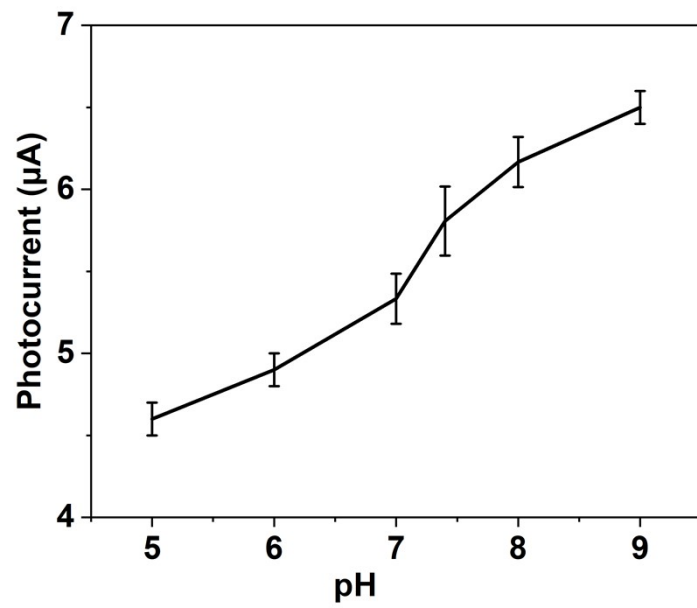


Figure S3 Optimization of pH.

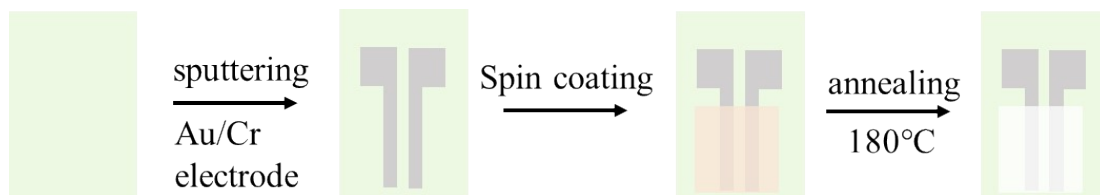


Figure S4 The schematic illustration of the fabrication of the OECT device.

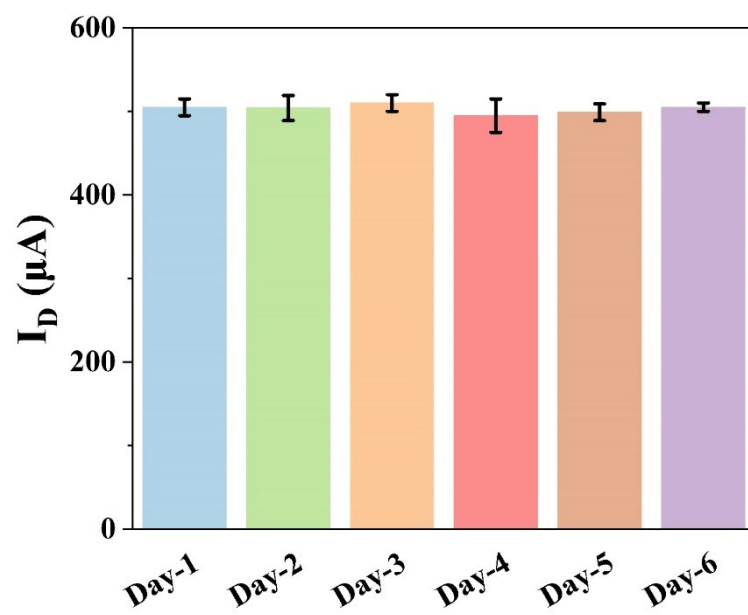


Figure S5 The reproducibility of OPECT biosensor.

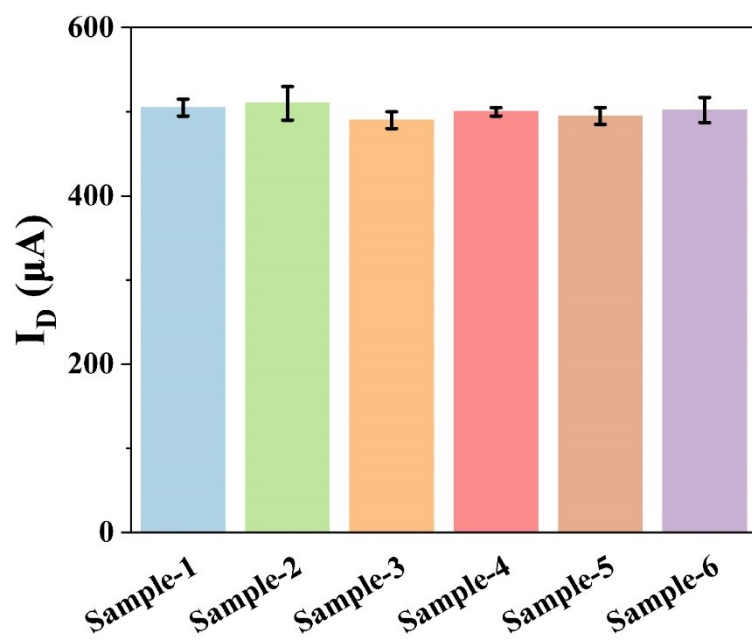


Figure S6 The stability of OPECT biosensor from different batches.

Table S1 Comparisons with other reported methods for the determination of BPA.

Method	Limit of detection	Linear Range	References
Fluorescence^a	7.11 μM	0 - 220 μM	1
LSV^b	0.13 μM	0.5 - 160 μM	2
MIP^c	0.015 nM	0.05 - 50 nM	3
SERS^d	3.9 pg mL^{-1}	0.001 - 1 ng mL^{-1}	4
This work^e	0.29 fg mL^{-1}	1 fg mL^{-1} – 0.1 ng mL^{-1}	-

a: PBS/DMSO (1/1, v/v, pH = 7.4). b: pH 7.0, PBS buffer solution. c: pH = 7, PBS buffer solutions. d: Deionized water. e: pH = 7.4, PBS buffer solution.

Reference

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