Electronic Supplementary Information

Silver nanoparticals anchored on nitrogen-doped graphene as a novel

electrochemical biosensing platform with enhanced sensitivity for aptamer-based

pesticide assay

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Fig. S1 TEM images of the as-prepared NG.



Fig. S2 XPS survey of the as-prepared Ag-graphene nanocomposites.



Fig. S3 CV curves obtained at (a) the bare GCE, (b) the Ag-NG/GCE, (c) the aptamer/Ag-NG/GCE, (d) the MCH/aptamer/Ag-NG/GCE electrode and (e) 1×10^{-9} M acetamiprid captured on the MCH/aptamer/Ag-NG/GCE in 0.1 M PBS (pH 7.0), 5 mM [Fe(CN)₆]^{3-/4-} and 0.1 M KNO₃.



Fig. S4 The comparison of the EIS responses for the aptasensors based on different nanomaterials before and after acetamiprid detection: (A) NG/GCE, (B) Ag-graphene/GCE, (C) Ag-NG/GCE.



Fig. S5 Effects of the aptamer concentration (A), the reaction time between aptamer and Ag-NG (B), solution pH value (C) and binding time of acetamiprid with aptamer (D) on the EIS responses of MCH/aptamer/Ag-NG/GCE.



Fig. S6 The selectivity of the aptasensor.

Table S1 Comparison of methods for the determination of acetamiprid.

Method	Linear range	Detection limit	Ref.
HPLC-DAD ^a	$2.24 \times 10^{-7} \sim 4.5 \times 10^{-7}$	$4.5 \times 10^{-8} \mathrm{M}$	1
LC-MS ^b	$2.25 \times 10^{-6} \sim 2.3 \times 10^{-5} \text{ M}$	$1.35 \times 10^{-7} \text{ M}$	2
ELISAs ^c	$1.35 \times 10^{-9} \sim 5.6 \times 10^{-8} \text{ M}$	$4.49 \times 10^{-12} \text{ M}$	3
Colorimetry	$1 \times 10^{-9} \sim 1 \times 10^{-5} \text{ M}$	4×10^{-8} nM	4
EIS-based aptasensor	$5 \times 10^{-9} \sim 6 \times 10^{-7} \mathrm{M}$	$1 \times 10^{-9} \mathrm{M}$	5
EIS-based aptasensor	$1 \times 10^{-13} \sim 5 \times 10^{-9} \text{ M}$	$3.3 \times 10^{-14} \text{ M}$	Our work

a, high-performance liquid chromatography diode-array detection;

b, liquid chromatography-mass spectrometry;

c, enzyme-linked immunosorbent assays.

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