An Acetylcholinesterase Functionalized Biosensor for Sensitive Detection of Organophosphorus Pesticides Based on Solution-Gated Graphene Transistors

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Table S1. Comparison of analytical performance for OP detection employing the SGGT sensor and other electrochemical biosensors.

Method	Electrode Functionalization	Detection limit (nM)	Linear range (nM)	Reference
DPV	AuNPs/PANI/GSPE	270	100 – 10000	1
DPV	AChE/Ti_3C_2Tx - CHIT /GR/GCE	14.45	22.6 – 11310	2
SWV	P_3TAA @AAS/Nafion/GCE	500	–	3
DPV	BCL@MOF nanofibers/ CHIT /GCE	67	100 – 38000	4
DPV	NiONPs/SPE	24	100 – 30000	5
Amperometry	lipase@ ZIF-8/ CHIT /GCE	28	–	6
SGGT	AChE/CHIT/Au	10	300 – 3000	this work

DPV: differential pulse voltammetric

SWV: square wave voltammetry

AuNPs: gold nanoparticles

PANI: polyaniline

GSPE: graphite screen-printed electrodes

AChE: acetylcholinesterase

Ti_3C_2Tx: transition metal carbides

CHIT: chitosan

GR: grapheme

GCE: glassy carbon electrode

P_3TAA: poly (3-thiophene acetate acid)

AAS: amino acids

BCL: *Burkholderia cepacia* lipase

NiO NPs: NiO nanoparticles

SPE: screen-printed electrodes

ZIF-8: Zeolitic imidazolate frameworks

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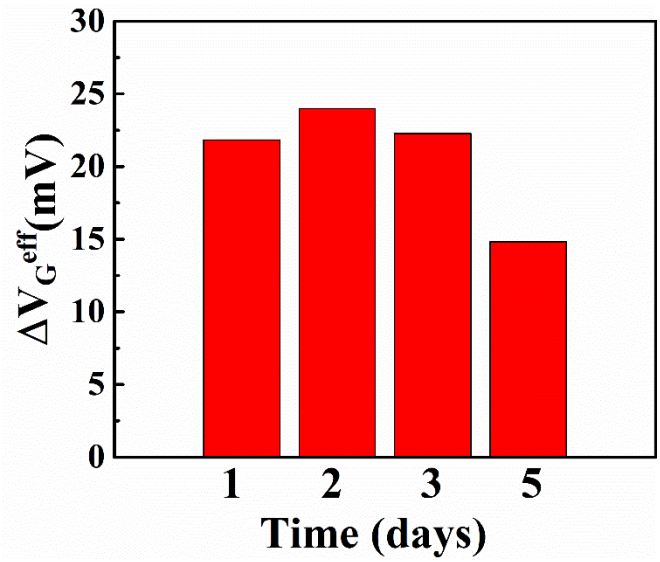

Figure S1. The repeatability of the SGGT device with the AChE/CHIT modified gate electrode for detection of trichlorfon (3 μM).

Table S2. The reproducibility of trichlorfon (1 μM) detection by different SGGT devices.

Different devices (reproducibility)	$\Delta V_G^{eff}(1)$	$\Delta V_G^{eff}(2)$	$\Delta V_G^{eff}(3)$	Mean	RSD
	16.84	17.97	15.96	16.92	1.42%

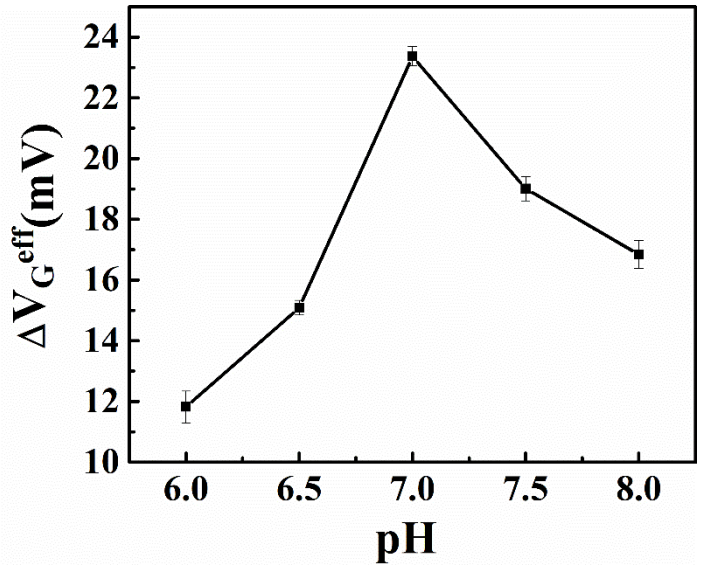

Figure S2. Effect of pH on variation of effective gate voltage of 3 μM trichlorfon in PBS buffer.